

SECTION 4.0

AFFECTED ENVIRONMENT AND CONSEQUENCES

4.1 LAND USE

4.1.1 Affected Environment

4.1.1.1 Regional Setting

Fort Detrick is situated in central Maryland approximately 45 miles west of Baltimore and 45 miles northwest of Washington, D.C. The installation is in the northwest portion of the city of Frederick in Frederick County, Maryland. The majority of the area surrounding Fort Detrick is urban (USAG Fort Detrick, 1998b). Fort Detrick consists of four noncontiguous parcels of land totaling 1,143 acres (USAG Fort Detrick, 2003b). These parcels are identified as Areas A, B, and C (two parcels) (USAG Fort Detrick, 2002b).

Area A, which includes the existing housing areas and the RCI footprint, is 728 acres and is the most developed area (John J. Kirlin Inc., 2000). It is bound by Yellow Springs Road to the west, a single family housing development and Frederick Community College to the north, Oppossumtown Pike to the east, and Military Road and off-post residential housing to the south and southeast. In addition to housing, Area A contains administrative buildings, community service facilities, recreation areas, and advanced research and development complexes (USAG Fort Detrick, 2002d). Figure 4-1 shows the land uses on and surrounding Area A.

Area B, which lies to the west of Area A and is 399 acres, includes the Fort Detrick municipal landfill, Flair Army Reserve training facility, antennae facilities, out-leased pasture, and the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) animal farm. Area C, located about a mile east of Area A near the Monocacy River, consists of two separate parcels that contain Fort Detrick's water treatment plant (7 acres) and wastewater treatment plant (9 acres) (Figure 1-1) (USAG Fort Detrick, 1998b; 2001b).

Fort Detrick has a temperate climate with four distinct seasons. The summers are short and warm, and winters are mild with occasional cold periods. Temperatures in Frederick County average 32 degrees Fahrenheit (°F) in the winter and 77°F in the summer (University of Maryland Department of Meteorology, 2002). The average annual rainfall for Frederick County is 40 inches (John J. Kirlin Inc., 2000).

4.1.1.2 Installation Land Use

Operating under the U.S. Army Medical Command (MEDCOM), Fort Detrick supports more than 34 Department of Defense (DoD) and non-DoD on-site tenant organizations. Land use and facilities are primarily focused on biomedical research and development, medical logistics and materiel management, global DoD telecommunications, and direct support to these missions (USAG Fort Detrick, 2003b). As of October 2002, there were 286 buildings totaling about 1,938,156 square feet (ft²) in Area A, resulting in a Floor-to-Area Ratio (FAR) of 0.06 (Federline, 2002). Area A land use is categorized into 13 land use types, as shown in Figure 4-1. Military housing currently represents approximately 15 percent of the total acreage (Table 4-1). Although Fort Detrick is federal property and not subject to City of Frederick or Frederick County zoning laws, compatibility of land use is an important consideration in the development of Area A (USAG Fort Detrick, 2002b).

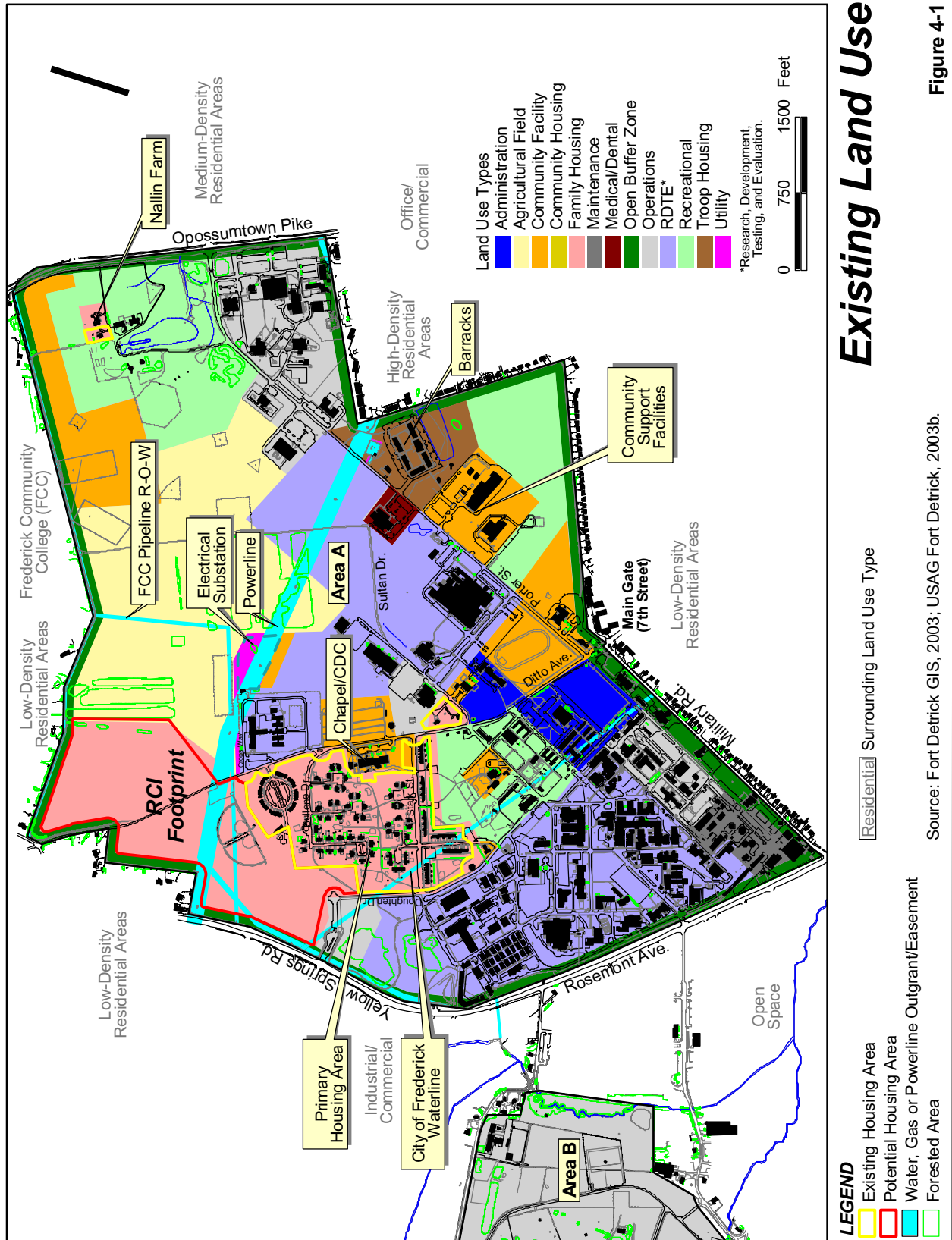


Table 4-1
Fort Detrick Land Uses

Land Use Type	Acreage	Percent of Total
Administration	19	2.6
Agricultural Field	99	13.6
Community Facility	72	9.9
Community Housing	3	0.4
Family Housing	112	15.3
Maintenance	9	1.2
Medical/Dental	3	0.5
Open Buffer Zone	59	8.1
Operations	61	8.3
Research, Development, Testing, and Evaluation	173	23.8
Recreational	99	13.6
Troop Housing	15	2.1
Utility	5	0.7
TOTAL	728	100.0

Source: USAG Fort Detrick, 2003b.

4.1.1.2.1 Housing

Installation Housing. Aside from the unaccompanied enlisted personnel housing (UEPH) barracks (Buildings 1532, 1533, 1534, 1535, 1536, and 1538) in the southern portion of Area A east of the Main Gate, two housing areas are provided for officers and enlisted personnel, the primary housing area (which includes the recently constructed Military Construction Army [MCA] housing units) and the Nallin Farm housing area. Together these two housing areas constitute about 48 acres of the 109-acre RCI footprint.

Primary Housing Area. This area consists of 189 units concentrated on about 47 acres in the northwest portion of Area A (Figure 4-1) and has a residential density (RD) of approximately 4.0 units per acre. It consists of two-, three-, four-, and five-bedroom units, which are generally bound by Ditto Road to the southeast, Doughten Drive to the west, and open fields to the north and northwest.

Community facilities are convenient to this housing area. The Child Development Center (CDC) and a church are adjacent to the housing area to the west, and to the south are a youth/teen center, bowling alley, and pool. Additional community services on the installation, such as the post exchange (PX), physical fitness center, and commissary, are southeast of the housing area and east of the Main Gate.

Nallin Farm Housing Area. The Nallin Farm housing area is in the vicinity of the Nallin Farm Historic District, which is in the northeast corner of Area A. There are two residences (Buildings 1652 and 1654), a detached garage (Building 1653), two barns (Buildings 1655 and 1656), a springhouse, and a pond to the south of the residences in this area. However, only one Nallin Farm housing unit (Building 1654) and about 0.7 acre surrounding it are included in the RCI footprint.

Proposed New Development Area. In addition to the primary housing area and the one structure in the Nallin Farm housing area, the RCI footprint includes a 61-acre parcel that lies north of the primary housing area. Much of this area is currently used for agricultural feed (hay) production (Boyland, 2003). Two athletic fields are also present in this area, and the remainder is open space.

Land Use Compatibility. Family housing areas at Fort Detrick are surrounded by generally compatible land uses, primarily open space and community, research, and administrative facilities.

4.1.1.2.2 Outgrants

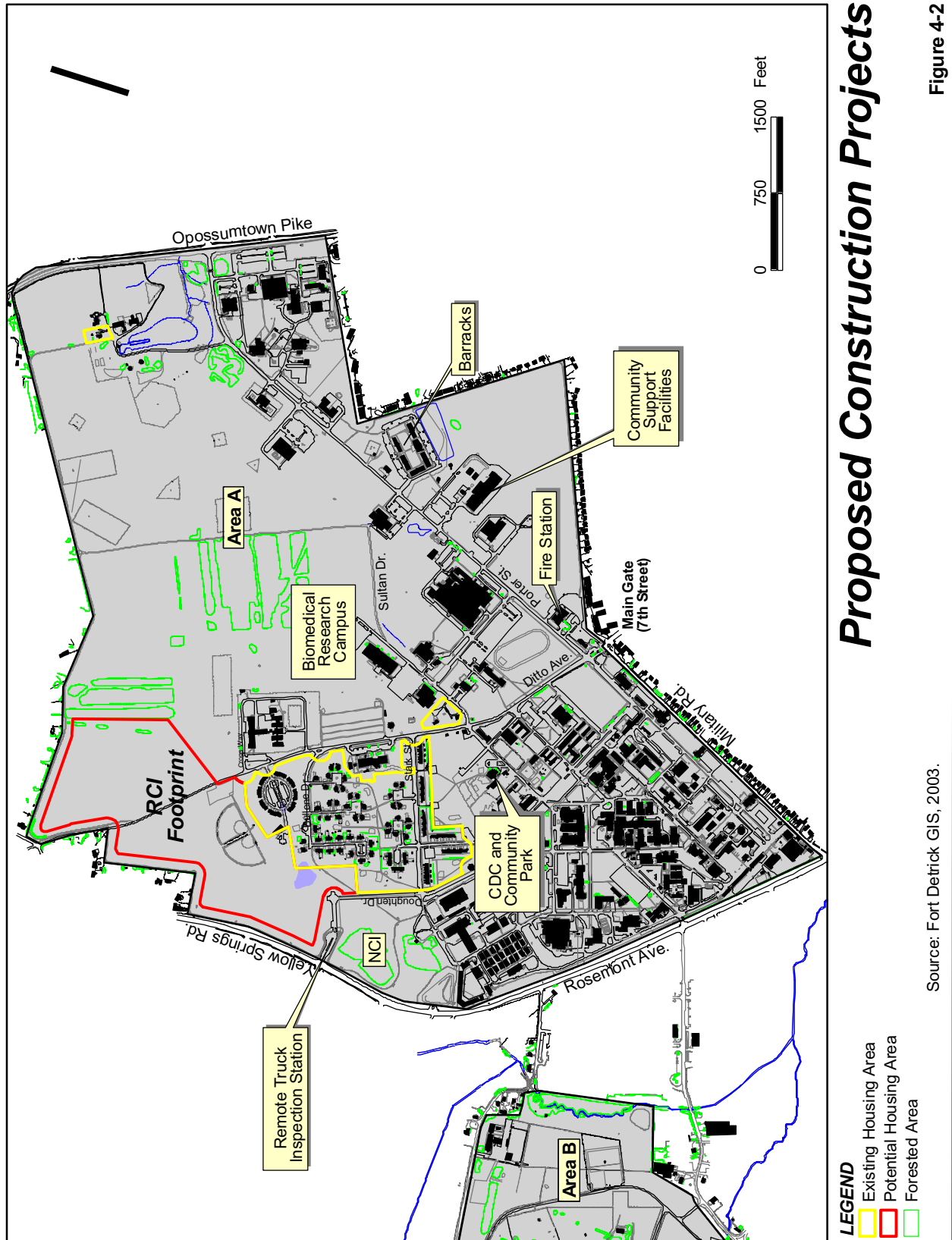
Four outgrants described below are authorizations of use of military real property controlled by the Department of the Army in the vicinity of the RCI footprint (Figure 4-1). Such authorizations can include leases, licenses, permits, easements, and consents on Fort Detrick.

- ⌘ *Frederick Community College Easement for Pipeline Right of Way.* This easement was granted for the construction and maintenance of a 12-inch waterline from a city of Frederick waterline on Yellow Springs Road (in the northwest corner of Area A), to the east across the RCI footprint past the U.S. Department of Agriculture (USDA) research facility, and then north to the installation perimeter near the college (see Figure 4-1). This easement, granted to Frederick Community College in 2000, is valid until 2050 and includes 1.2 acres in the RCI footprint (U.S. Army, 2000).
- ⌘ *Allegheny Power Easement (#1) for Electric Power Transmission or Communications Facilities.* This easement was granted in 1971 to the Potomac Edison Power Company (PEPCO), now Allegheny Power (AP), for the construction, operation, and maintenance of an overhead 230 kilovolt (kV) line, an overhead 34.5 kV line, and a switching station (see Figure 4-1). This 50-year right-of-way enters the northwest portion of Area A just off Yellow Springs Road, crosses the RCI footprint north of the existing housing areas, and extends in a generally southeast direction across the installation. The easement totals 23.4 acres and does not exceed 82.5 feet on each side of the centerline (U.S. Army, 1971). Approximately 3.5 acres of this easement are within the RCI footprint.
- ⌘ *Allegheny Power Easement (#2) for Electric Power Transmission or Communications Facilities.* This 50-year easement, granted on May 12, 1999, to PEPCO (now AP), is for the construction and operation of an electrical substation. Construction is essentially complete on an approximately 4-acre area east of the RCI footprint, adjacent to the east side of the USDA research facility. This easement expires in 2049 (USAG Fort Detrick, 2002d).
- ⌘ *City of Frederick Easement for Waterline.* Approximately 1 acre of this easement, which is designated for a waterline that crosses Fort Detrick and was constructed before the installation was established, lies within the RCI footprint.

4.1.1.2.3 Future Development

This section describes major current construction projects under way at Fort Detrick, as well as major projects currently being designed or developed for Areas A and B. Figure 4-2 highlights some of these proposed projects that are slated for construction near the RCI footprint or that would provide community services to Fort Detrick residents.

Current Construction. Projects currently under construction in Area A include physical security improvements, United States Army Center for Environmental Health Research (USACEHR) facility renovation (Building 568), existing family housing remodeling, and AP electrical



substation construction. Projects in the immediate vicinity of the RCI footprint are described in detail below.

- ⌘ *Existing Family Housing Remodeling.* This remodeling program is a 3-year renovation of existing housing units that entails replacement of windows, exterior doors, exterior siding, interior doors, floor tiles, and trim with lead-based paint (LBP). This project is scheduled for completion in early 2004 (Cole, 2003).
- ⌘ *Allegheny Power Electrical Substation.* Construction of an AP electrical substation in Area A, just east of the current housing area on the east side of the U.S. Department of Agriculture (USDA) research facility, is essentially complete. The substation would initially contain one 230-12.5 kV transformer, but would be designed for the future installation of three additional transformers (USAG Fort Detrick, 2002d). Further discussion of this facility is provided in Section 4.11.1.4, Energy Sources.

Proposed Short-Range Projects (Fiscal Year [FY] 2003-04 funding). Twelve approved projects are currently in the design or development phases (USAG Fort Detrick, 2003b). These projects include a fire station renovation/expansion, barracks (UEPH II) complex, UEPH II dining facility, commissary and PX, National Institute of Allergy and Infectious Diseases (NIAID) integrated research facility (IRF), 6MLMC Company Operations Facility, USAMRIID animal facility, water fluoridation project, relocation of a jogging track, and renovation of Building 1520. Those proposed construction projects near the RCI footprint, or those that would provide community services to Fort Detrick residents, are described in more detail below.

- ⌘ *Fire Station Expansion-Building 1504 (FY 2003 funding).* Renovation of the existing building near the Main Gate and construction of a new five-bay drive-through apparatus room adjacent to the existing facility would provide the requirements for a two-company fire station and meet special hazardous materials (HAZMAT) response mission requirements. Construction is slated to begin in mid-2004.
- ⌘ *Community Support Center-Building 1520 (FY 2003).* This project entails renovation of Building 1520, a former warehouse currently used as the community support center (CSC) in the southern portion of the installation. Renovation would create a consolidated CSC that will co-locate such activities as the One Stop In/Out Processing Center, Army Continuing Education System (ACES) Facilities, and the Army Community Services (ACS) Center (a description of ACS functions is provided in Section 4.9.1.3, Quality of Life).
- ⌘ *Commissary and PX (FY 2003).* A 34,000 ft² commissary will be constructed on an undeveloped parcel in the south central portion of Area A, south of Porter Street and east of the fire station. The facility will offer food and household items typically found in retail grocery stores. The PX will be located in the south central portion of Area A, north of Porter Street and east of Ditto Street where the jogging track is currently located. It will include a troop store with a garden sales area, shopette with fast food services, laundry services facility, barber and beauty shop, mall area, and separate gas station.

Proposed Long-Range Projects (FY 2005 and beyond). Twenty-four projects are proposed, conceptual, or currently being studied (USAG Fort Detrick, 2003b). They include the Medical Logistics System (MEDLOG) relocation, U.S. Army Medical Research and Materiel Command (USAMRMC) headquarters building, replacement of Building 1686, infrastructure for a Biomedical Research Campus, National Cancer Institute (NCI) expansion (22-acre parcel), NCI Main Campus revitalization, USAMRIID expansion, antenna relocations/replacements, Main Gate reconfiguration, Area A gate upgrades, barracks parking lots, vehicle inspection station,

central utility plant, CDC expansion, hotel and conference center complex, wetland and forestation projects, cultural areas projects, Nallin Pond recreation park, community park, and indoor pool addition. Projects planned to be constructed near the RCI footprint are described in more detail below.

- ⌘ *Child Development Center (FY 2008 funding)*. This project involves construction of a stand-alone expansion for Fort Detrick's existing youth center that lies to the south of the RCI footprint. This facility will contain many facilities and services including areas for arts and crafts, homework, and computer use; a staff and parent lounge; and a commercial kitchen. It will allow the installation to meet all remaining requirements of Fort Detrick's School Age Services (SAS) Program.
- ⌘ *Remote Truck Inspection Station (FY 2007)*. A remote truck inspection station would be constructed to replace the Old Farm Gate, which lies just west of the RCI footprint. The 4,800 ft² facility would consist of two entrances and two exit lanes, three truck inspection lanes, two passenger vehicle lanes, a two-bay vehicle inspection shed with under-truck inspection pits, electronic detection equipment, exterior lighting, two guardhouses, and barricades. This site will process an estimated 240 inspections per day (assuming 15 minutes per vehicle).
- ⌘ *Community Park (Proposed)*. This park would be located on about 15 acres south of the Primary Housing Area. Currently this area contains an existing service station, several old trailer buildings, the existing youth center and playgrounds, outdoor pool, and tennis courts. Once completed, the park would surround the youth center and CDC and would include two lighted baseball fields, youth soccer field, pavilion, concession stand, restrooms, two playgrounds, volleyball court, basketball courts, and asphalt multipurpose trail. Parking and road alignments would be improved to enhance safety and convenience to surrounding work areas.
- ⌘ *NCI Expansion (Conceptual)*. NCI-Frederick is considering new development for a 22-acre open-buffer zoned parcel that lies directly north of the current 68-acre NCI campus. Plans also exist for revitalization and new development within the current campus.
- ⌘ *USAMRIID Expansion (Conceptual)*. USAMRIID is evaluating the feasibility of expanding and revitalizing its current facilities. The project may include the construction of a new 1,000,000 ft² facility within the proposed Biomedical Research Campus and adjacent to the proposed NIAID IRF.

4.1.1.3 Surrounding Land Use

Areas adjacent to the northern, southern, and eastern borders of Area A are predominantly classified as low-density residential, with a few small sections of high density residential areas. Frederick Community College is adjacent to the northeast corner of Area A. In addition to conservation areas, the land between Area A and Area B includes areas designated as office/neighborhood commercial, institutional (e.g., County Health Department, Citizens Nursing Home), limited industrial, general commercial, and residential. City and county roads border the installation in several areas, creating a physical division between land uses on the installation and those of adjacent off-site areas (USAG Fort Detrick, 1998b). A single-family residential neighborhood called Clover Hill is adjacent to Fort Detrick to the north of the RCI footprint.

4.1.2 Consequences

4.1.2.1 Proposed Action

Long-term minor adverse and beneficial effects on land use would be expected as a result of the proposed action. Portions of open space buffer and recreational areas would be converted to

residential housing, reducing those land use inventories. However, development of the agricultural field in the undeveloped portion of the RCI footprint to housing areas would be compatible with surrounding land uses. The proposed construction would also increase the amount of impervious surfaces. All pertinent erosion control and storm water management standards would be implemented as specified in the Community Development and Management Plan (CDMP). Overall, implementation of the proposed action is consistent with installation's current land use planning.

The proposed action would increase available housing on Fort Detrick by about 61 acres and bring total housing (including barracks) to about 135 acres, or about 12 percent of the total acreage of Area A. Demolition efforts, if deemed viable, would free up land to allow planners to make best use of existing and desired compatible land uses and provide for more efficient use of land. The expansion of residential housing would include new units with smart growth design centered around expanded and improved community resources and work areas. They would be designed with enhancements specified in the CDMP, such as improved landscaping and improved and regular maintenance programs. The addition of such amenities would be expected to result in a long-term beneficial effect on the housing areas.

No existing housing areas would be converted to other uses, and no major incompatible land uses would be expected from implementation of the proposed action. However, construction and operation of the proposed truck inspection station just east of the existing housing area and adjacent to the RCI footprint could result in an incompatible land use and potentially pose localized air quality, noise, aesthetic, and safety concerns to on-post residents. Proper consideration and planning in the design of these facilities along with proper site planning for the new housing units would mitigate these potential concerns. These projects are discussed further in Section 4.13, Cumulative Effects Summary.

The proposed action would not be expected to affect off-post land use surrounding Fort Detrick. The new housing areas on-post would be compatible with land use in existing off-post neighborhoods. No construction of on-post housing units or access roads is planned within 100 feet of the installation boundary to adhere to a DoD policy of restricting future on-post development near installation boundaries for security reasons. An existing buffer of trees along the installation boundary would be expanded as planned in the CDMP, as discussed in Section 4.7.2.1. This 50-foot buffer vegetated with trees 50 to 100 feet from the installation boundary would ensure safety, aesthetic quality, and reduced noise levels for off-post residents.

4.1.2.2 No Action Alternative

No effects on land use would be expected. No changes to land-use designations would occur under the no action alternative. On-post residential areas would be maintained at present, with no changes or improvements anticipated other than those undertaken in the course of normal maintenance activities.

4.2 AESTHETICS AND VISUAL RESOURCES

4.2.1 Affected Environment

Aesthetics and visual resources at Fort Detrick consist of natural and man-made features present on the installation landscape. They include cultural and historic resources, areas of particular beauty or significance, water surfaces, and vegetation. Together, these features form the overall impression that a viewer receives of an area and its landscape.

Area A is built on relatively level topography. Buildings vary in size and style, having been constructed prior to the 1950s to the present. The overall visual impression is that of an urbanized area with functional efficiency, order, and focused activity, similar to a campus setting.

Because maintenance is provided at a relatively high level, there is an overall appearance of cleanliness and order.

The existing housing areas are generally characterized by mowed common areas, some landscaping around homes, and mature trees scattered throughout. The view from the RCI footprint is primarily open space and nonintrusive installation facilities. The undeveloped portions of the RCI footprint are primarily open fields. Aerial power lines, which can be considered aesthetically unpleasing, cross the footprint just north of the existing housing areas. The vista from the Nallin Farm housing area is to open fields to the north and a pond to the southwest. The large pond, historic barns, well-manicured lawns, and mature trees to the south are visually pleasing.

4.2.2 Consequences

4.2.2.1 Proposed Action

Short- and long-term minor adverse and long-term beneficial effects would be expected. Short-term adverse effects would result from construction activities, which are inherently aesthetically displeasing. During the construction and renovation phases of the RCI program, vistas from various vantage points on the installation would be disrupted by construction equipment, construction material staging areas, and bare land as buildings undergo construction or demolition. These effects, however, would be short term and localized to the areas under construction. Construction activities would be limited to daylight hours; therefore night-time construction activities and associated lighting would not be expected to occur.

Long-term minor adverse effects would result from new construction in the undeveloped areas, which would replace some open vistas with landscaped housing areas, permanently altering the natural viewsheds in these areas. Potential adverse effects on the natural vistas would be greatly reduced by implementing the CDMP, which takes the natural surroundings into account and integrates them into the community design. Long-term beneficial effects would be expected from proper implementation of the CDMP, which is designed to achieve an aesthetically harmonious community through the use of cohesive and regionally appropriate architectural design characteristics, landscape planning that focuses on using native plant species and screening visually intrusive structures, and activities with vegetation and inclusion of green space. With linked open spaces, strategic tree locations, trail systems, activity areas, and street layouts that enhance the quality of outdoor life, the sense of community would be heightened and improved. Furthermore, regular and preventive maintenance programs outlined in the CDMP would maintain the revitalized housing areas at the highest operation levels. As a result of the RCI program, the overall aesthetic appeal of the existing housing areas would be improved.

The CDMP also takes off-post residential areas into consideration by incorporating a 100-foot setback from the installation boundary in which no development would occur. The setback includes 50 feet of open space from the installation boundary and a 50-foot wide vegetation buffer that would separate the open space from an on-post perimeter road to be constructed for access to the housing areas. The vegetated buffer would provide visual, light, and noise attenuation between the on-post housing areas and off-post residential neighborhoods during the construction and operation phases of RCI, as planting would begin prior to construction activities. Therefore, adverse effects on off-post residential areas would be expected to be limited to the short-term construction activities. Additional discussion on the vegetated buffer is provided in Section 4.7.2.1.

To minimize long-term light pollution from the RCI project, street and housing lighting for RCI would be consistent with applicable City of Frederick and Frederick County zoning regulations and should be similar to standard City of Frederick lighting fixtures. Other mitigation includes

using "full-cutoff" luminaries to avoid uplight or glare, keeping lighting poles low and spaced more closely, focusing light downward, and avoiding mercury vapor lamps. Establishment of the vegetated buffer discussed previously would also minimize light pollution on off-post neighborhoods, although some short-term adverse effects may occur while the buffer establishes growth. Light generated from street and housing fixtures should be contained within the installation boundary (City of Frederick, 2003).

4.2.2.2 No Action Alternative

Long-term minor adverse effects would be expected in the housing areas. Under the no action alternative, the Army would continue to be responsible for maintenance and renovation of existing housing, and construction of new housing as necessary. The current lack of sufficient funding for housing construction and an extensive backlog of work indicate that the housing units would deteriorate over time, which would adversely affect visual and aesthetic resources on the installation.

4.3 AIR QUALITY

4.3.1 Affected Environment

Fort Detrick is in Frederick County, which is within the Central Maryland Air Quality Control Region (Area II). Air quality in this region is regulated and enforced by the Maryland Environmental Air Management Administration with rules promulgated by the U.S. Environmental Protection Agency (EPA). The Maryland Department of the Environment (MDE), the overall authority for air quality at the state level in Maryland, has adopted an implementation plan to achieve compliance with the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. Frederick County meets or exceeds the NAAQS for particulate matter (PM₁₀), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), and lead (Pb) as established by EPA and is therefore considered an attainment area for these five pollutants according to 40 CFR 81.319. However, because of mobile emissions, Frederick County is classified as a severe nonattainment area (NAA) for ozone (O₃) (USEPA, 2002; USAG Fort Detrick, 2003b).

Fort Detrick Existing Air Quality Conditions. Fort Detrick is designated as a major stationary source of air pollutants and has submitted an application to EPA for a Title V Operating Permit. The Title V Operating Permit is an EPA enforceable document that combines all stationary source emissions into one document. Fort Detrick has conducted an air emissions inventory and a regulatory analysis and compliance assessment to determine the installation's compliance status of each emission source with all applicable regulatory requirements. Fort Detrick maintains compliance with the Clean Air Act (CAA) and all other federal, state, and local requirements.

Stationary Sources. Permitted stationary sources include gasoline storage, fueling and dispensing facilities, boiler plant, oil-fired generators, facility boilers, medical waste incinerators, solvent usage, and landfills. Table 4-2 lists Fort Detrick's total annual emissions during the period 1996–2002 for criteria pollutants and for toxic and hazardous air pollutants regulated by EPA and/or MDE. The largest contributors to the emissions in Table 4-2 are the large boilers and medical incinerators. The last two rows of Table 4-2 compare all stationary source emitters such as cement plants, aluminum plants, and gas, oil, and electric companies in Frederick County with Fort Detrick for 1999. Fort Detrick's contribution to Frederick County's total emissions is very low.

Ground Mobile Sources. Mobile sources at Fort Detrick consist of civilian and government-owned vehicles. About 6,900 employees (civilian plus military) commute from the nearby city of Frederick, driving approximately 25 miles round-trip to and from work. More than 12,000 vehicles pass through the Fort Detrick gates daily (USAG Fort Detrick, 2003b; 2002c).

Table 4-2
Fort Detrick Stationary Source Pollutant Emissions (tons/year)

Year	Criteria Air Pollutants ¹					HAP/ TAPs ²
	Total VOCs	NO _x	CO	SO ₂	PM ₁₀	
1997	1.6	138.2	19.1	234.7	40.7	0.1
1998	2.6	109.4	33.9	180.0	20.9	6.7
1999	2.1	88.7	40.8	238.3	24.3	6.6
2000	2.9	107.7	27.1	445.1	35.5	6.8
2001	2.6	116.8	24.9	443.9	35.1	6.8
2002	3.1	89.6	28.9	280.2	29.9	0.1
All Frederick County Sources (1999)	8,810	112,185	49,671	305,485	11,955	-
Percent Fort Detrick Contribution to Frederick County (1999)	0.02%	0.08%	0.08%	0.08%	0.02%	-

¹ Criteria Pollutants: VOCs = volatile organic compounds; NO_x = nitrous oxides; CO = carbon monoxide; SO₂ = sulfur dioxide; PM₁₀ = particulate matter less than 10 microns in diameter. Fort Detrick does not emit reportable quantities of lead, a sixth criteria pollutant.

² HAP/TAPs = Toxic Air Pollutants. Includes "hazardous air pollutants (HAPs)" listed by EPA and "toxic air pollutants (TAPs)" listed by MDE.

Sources: MDE, 2002; Wolf, 2003.

4.3.2 Consequences

4.3.2.1 Proposed Action

Short-term direct minor adverse effects on the air quality as a result of criteria pollutant emissions and fugitive dust caused by construction equipment would be expected. The construction period would be expected to from 18 to 24 months. Operations and maintenance (O&M) of the new units would not cause any increase in air quality deterioration compared to the O&M processes of existing units. Construction equipment and fugitive dust would cause only minor short duration deterioration in air quality. For regulatory purposes, EPA and states prefer that actual source test emissions be conducted on mobile emitters. Recognizing the time and cost involved with such source testing, EPA recommends the use of listed emission factors in AP-42 (USEPA, 1998) in lieu of source testing. Table 4-3 shows the estimated generation of criteria pollutants during the year of heaviest construction and demolition. These levels of air degradation would be very minor and of short, intermittent duration. Calculations for emissions generated from the construction of 292 new housing units and demolition of 127 units are provided in Appendix C.

The criteria pollutants generated from this proposed action conform to EPA criteria because they are de minimis with respect to the levels allowed in a severe NAA as shown in Table 4-3. These emissions represent an increase of 0.015 percent for NO_x, and 0.03 percent for VOC in Area II. Since these values are de minimis, and the emissions are less than 10 percent of the regional values for each pollutant, the proposed action meets the requirements of the general conformity

Table 4-3
Estimated Total Air Emissions From Construction and
Demolition Activities (tons/yr)

Pollutant	De Minimis Levels for	
	Severe NAA	Total Emissions (tons)
NO _x	25	10.93
VOC	25	4.31
CO	100	11.16
PM ₁₀	50	1.03
SO _x	100	0.65

Sources: Tetra Tech, 2003; USEPA, 2002.

determination rule. A Record of Non-Applicability (RONA) concerning the general conformity determination is provided in Appendix C.

Following RCI construction, the increase of 163 on-post housing units would be expected to result in a decrease in mobile emissions generated from vehicles of on-post residents, as 163 additional military personnel would commute to work from on-post rather than from off-post. Personnel would be expected to drive a shorter distance to and from on-post facilities than when they resided off-post.

4.3.2.2 No Action Alternative

Under the no action alternative, there would be no major changes in housing at Fort Detrick, aside from renovations. Therefore, no effects on air quality would be expected.

4.4 NOISE

4.4.1 Affected Environment

Responses to noise vary, depending on the type and characteristics of the noise, the expected level of noise, the distance between the noise source and the receptor, the receptor's sensitivity, and the time of day. One significant response to noise is annoyance, and the level of annoyance is dependent on or associated with an activity. The five factors identified as being indicators for estimating community complaint reaction to noise are type of noise, amount of repetition, type of neighborhood, time of day, and amount of previous exposure.

Noise levels below 65 decibels (dB) are considered to be normally acceptable in suitable living environments. Levels above 65 dB can cause annoyances and some hearing loss depending on the time of exposure. According to the National Institute for Occupational Safety and Health (NIOSH), the maximum recommended allowable exposure time for occupational workers at 85 dB is 8 hours. Some typical sound levels include thunder (110 dB), jackhammer (88 dB), backhoe (80 dB), alarm clock (75 dB), and normal conversation (60 dB) (HSE, 2002).

Fort Detrick is considered a relatively quiet environment. It does not have an airfield, industrial operations, weapons range, training range or other significant source of noise. Noise sources on Fort Detrick include boiler plant, generator facilities, carpenter shop, and daily operations traffic. The installation has a helicopter pad that is used infrequently. Based on noise levels measured in 1991, the actual noise generated from these potentially harmful operations was at levels compatible with residential land use (U.S. Army, 1991b).

4.4.2 Consequences

4.4.2.1 Proposed Action

Short-term direct minor adverse effects would be expected. During construction activities, the operation of construction equipment in the vicinity of the RCI footprint would be an additional source of noise. Noise produced by construction equipment varies considerably depending on the type of equipment used and its operation and maintenance. Heavy construction equipment producing noise levels greater than 65 dB is generally used only during the first 3 to 4 months of a project for activities such as excavation. Actual housing construction dominates the majority of the project time, and noise generated during this phase is generally less than during the excavation period. In addition, the construction equipment normally does not operate a full 8 hours each day. The proposed activity would result in short-term increases in the noise level and would cause intermittent annoyances above 85 dB on the construction site. Construction workers would wear approved ear protection devices while operating or near equipment producing more than 65 dB. The receptors closest to the construction activities include persons occupying the existing housing nearest the construction sites. The nearest occupied on-post residential dwelling would be a minimum of about 150 feet from a construction site, where the estimated noise levels would continually be greater than 65 dB. Off-post residential dwellings would be an estimated minimum of 250 feet from the nearest construction site. Construction activities would be limited to daylight hours during the normal workweek to reduce noise stress on and annoyance to nearby residents.

Construction and operation of the proposed truck inspection station just east of the existing housing area and adjacent to the RCI footprint could result in an incompatible land use and could potentially pose localized noise concerns to on-post residents, although the distance between the inspection station and the nearest proposed house would be an estimated 450 feet. Proper consideration and planning in the design of these facilities along with proper site planning for the new housing units would mitigate these potential concerns. Potential additional mitigation measures include earthen berms and tree buffers between the housing areas and the inspection station. These projects are discussed further in Section 4.13, Cumulative Effects Summary.

The CDMP also takes off-post residential areas into consideration by incorporating a 100-foot setback from the installation boundary in which no development would occur. The setback includes 50 feet of open space from the installation boundary and a 50-foot wide vegetation buffer that would separate the open space from an on-post perimeter road to be constructed for access to the housing areas. The vegetated buffer would provide noise attenuation between the on-post housing areas and off-post residential neighborhoods during the construction and operation phases of RCI, as planting would begin prior to construction activities. Therefore, adverse effects from noise on off-post residential areas would be expected to be limited to short-term construction activities. Additional discussion on the vegetated buffer is provided in Section 4.7.2.1.

4.4.2.2 No Action Alternative

No major changes in Fort Detrick's housing facilities would occur, apart from renovations. Therefore no noise effects would be expected.

4.5 GEOLOGY AND SOILS

4.5.1 Affected Environment

4.5.1.1 Geologic and Topographic Conditions

Fort Detrick lies in the Frederick Valley geologic subdivision, which is in the western portion of the Piedmont Physiographic Province. The Frederick Valley is characterized by rolling terrain

and somewhat incised stream valleys and is bordered to the west by the Catoctin Mountains. The elevations of the RCI footprint at Fort Detrick range from approximately 360 to 380 feet above sea level, and slopes are gentle, being generally less than 3 percent (USAG Fort Detrick, 2002c).

The RCI footprint at Fort Detrick is underlain by fractured limestone and dolomite of the upper Cambrian Frederick Formation and two of its members, the Rocky Springs Station Member and the Adamstown Member. These members are thinly bedded limestone, containing dolomite and coarse sand layers. The Frederick Formation has been known to develop karst features such as sinkholes, which are naturally occurring closed depressions that form when groundwater dissolves the underlying limestone bedrock and creates a subsurface conduit or cavern. Construction over closed depressions may increase the potential for a sinkhole collapse. The U.S. Army Corps of Engineers (USACE) prepared a map of sinkhole/depression and fracture trace/lineament features on Fort Detrick using the 1988 U.S. Geological Survey Frederick, Maryland 7.5-minute topographic quadrangle map and aerial photographs from 1937. These features were identified based on topographic characteristics, vegetation, and soil tone indicators of subcircular depressions. Four sinkholes/depressions were identified in the existing housing area, and one was observed along the northern boundary of the undeveloped portion of the RCI footprint and the installation boundary. Two fracture trace/lineament features bisect the undeveloped portion of the footprint observed, one parallels the northern boundary, and several overlap the southwestern portion of the existing housing area (USACE, 2001).

Fort Detrick is in seismic zone 1, in which minor damage would be expected should an earthquake occur (USAG Fort Detrick, 2003b). No mineral resources have been identified on the installation.

4.5.1.2 Soils

The three primary soil series found in the RCI footprint and on Fort Detrick are the Adamstown, Duffield, and Hagerstown silt loams (Figure 4-3). The Adamstown series consists of very deep, moderately well drained soils with slow to moderately slow permeability. The Duffield series consists of very deep, moderately well drained soils with moderate permeability. The Hagerstown series consists of very deep, moderately well drained soils with moderate permeability (USDA, 2002). Available water capacity is low to moderate. Fort Detrick is primarily underlain by limestone bedrock that weathers to a reddish-brown sandy clay (USAG Fort Detrick, 2002c).

Soil contamination is a potential issue throughout the developed portion of the RCI footprint. Chlordane, a pesticide applied to foundations of wooden structures to prevent termite intrusion, was used throughout the existing housing areas until 1988, when it was banned from further use by EPA, pending further carcinogenic risk assessments. Other potential soil contaminants throughout the footprint include crop pesticides from agricultural land uses; use and storage of solvents, paints, fuels, and other types of everyday household products; lead from LBP chippings; asbestos-containing material (ACM); and polychlorinated biphenyls (PCBs). These issues are discussed in further detail and analyzed in Section 4.12, Hazardous Waste.

4.5.1.3 Prime Farmland

The Adamstown and Duffield silt loams and some of the Hagerstown loams are considered prime farmland soils (USDA, 2002). Nearly all the 61-acre undeveloped northern half of the RCI footprint is considered prime farmland soils, and much of it is currently used primarily for agricultural feed production (hay). Figure 4-3 shows prime farmland soils on Fort Detrick.

4.5.2 Consequences

4.5.2.1 Proposed Action

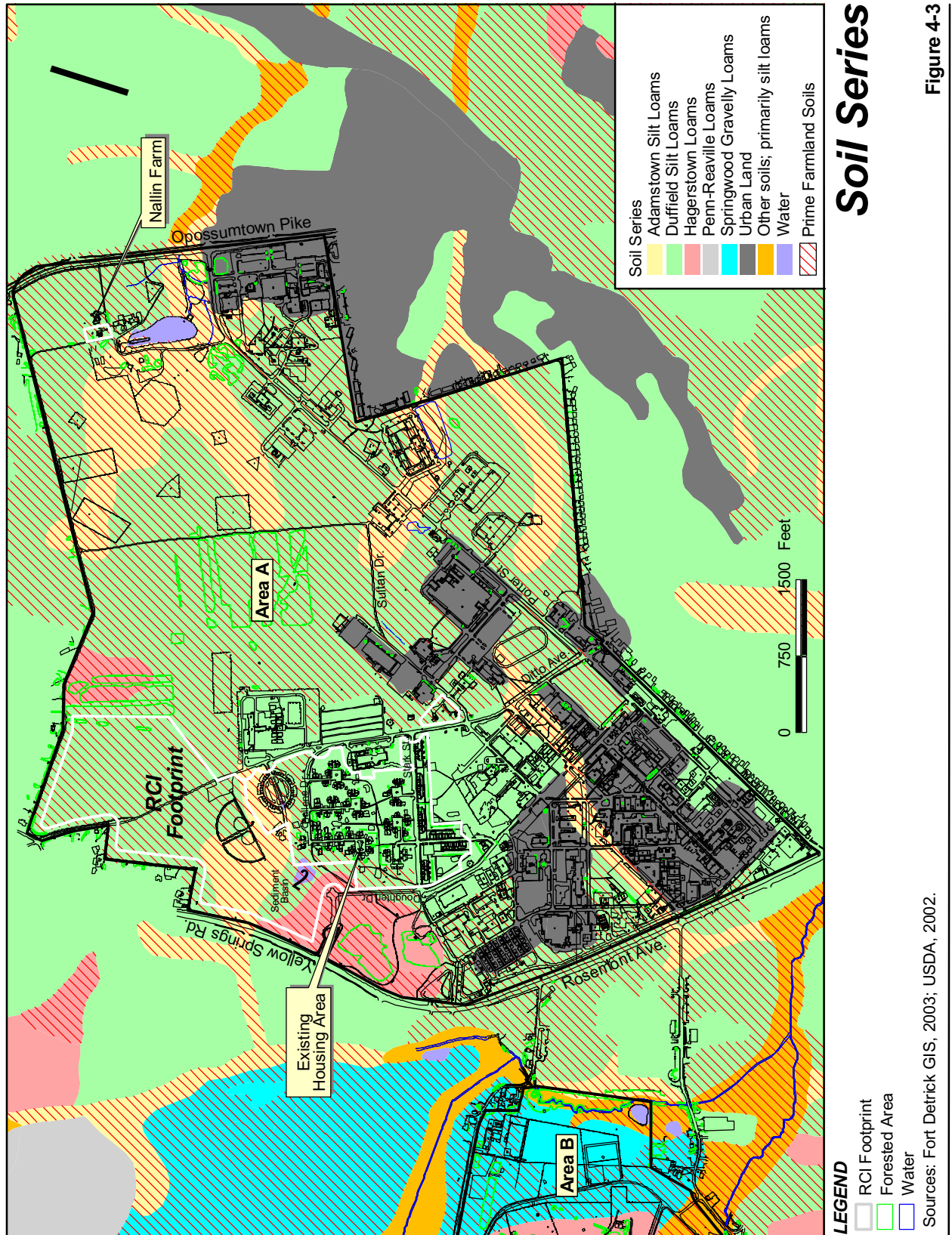
Geology. No effects would be expected. Construction should not take place near known sinkholes unless unavoidable and until remedial action has occurred or is taken. Site evaluations for areas potentially susceptible to sinkholes or areas where sinkholes were previously identified should be conducted for existing buildings before renovation activities and for new sites before new housing construction. Evaluations should be performed using appropriate and accepted methods (such as ground-penetrating radar) to assess the stability of the subsurface and to determine whether or not conduits or caverns exist under the site. If a potential sinkhole is found, remedial actions, such as filling and/or plugging, should be considered to avoid sinkhole collapse and associated structural and safety concerns. In addition, GMH should follow best management practices (BMPs) for karst topography as recommended in the *2000 Maryland Storm Water Design Manual* Section 4.2 (Fritz, 2002).

Topography. No effects on topography would be expected.

Soils. Short- and long-term minor adverse effects would be expected. In the short term, increased runoff and erosion would likely occur during RCI housing construction because vegetation would be removed, increasing the susceptibility of soil to water and wind erosion. However, these effects could be minimized by implementing a storm water management system that uses appropriate BMPs for controlling runoff, erosion, and sedimentation. Recommended BMPs include, but are not limited to, silt fences, straw bale dikes, diversion ditches, seeding or sod to vegetate exposed soil, riprap channels, water bars, water spreaders, and sediment basins. An erosion and sediment control plan for land clearing, grading, or other earth disturbance approved by MDE is required under Code of Maryland (COMAR) 26.17.01 for construction activities involving more than 100 cubic yards or more than 5,000 square feet (ft²). Storm water discharges associated with construction activities are covered under the General Permit for Construction Activity (General National Pollutant Discharge Elimination System (NPDES) No. MDR10, State Discharge Permit No. 03-GP). Construction activities that disturb 1 acre or more will submit a Notice of Intent (NOI) to the MDE to ensure coverage under the General Permit (Lewis, 2003). Potential effects on soils would be limited to those areas where renovation of existing houses and construction of new houses are expected.

Long-term minor adverse effects on soils would be expected because increasing the amount of impervious surfaces by constructing new housing areas would increase the flow of storm water onto soils, which in turn would increase erosion. However, GMH is planning to construct two storm water management facilities to complement the existing 40,000-ft² basin just west of the recently completed MCA housing area. The two new basins would be located on-post between proposed Villages 1 and 3, and would have a combined surface area of 105,000 ft² (Figure 2-3). The ponds will be designed in accordance with the *2000 Maryland Storm Water Design Manual*. The ponds would be sited as to not conflict with the AP aerial powerline easement discussed in Section 4.1.1.2.2.

Prime Farmland. Long-term negligible to minor adverse effects would be expected. Agricultural fields in the northern half of the RCI footprint would be converted to residential housing areas. The Farmland Protection Policy Act (FPPA) requires federal agencies to take into account the adverse effects of development projects on the preservation of farmland, and completion of the Farmland Conversion Impact Rating Form (Form AD-1006) would be required. As stated in Section 658.5 of the FPPA, the form measures the relative value of the prime farmland on the site and evaluates the site in the context of land use of the surrounding area (Department of the Navy, 2003). The approximately 61 acres of prime farmland soil that would



be affected represent less than 0.1 percent of the approximately 110,000 acres of prime farmland soil in Frederick County (USDA, 2002). Therefore, the proposed action would not contribute to significant conversion of farmland. In addition, Fort Detrick has sufficient acreage in Area B that could replace the agricultural land in the RCI footprint if necessary (Federline, 2002).

4.5.2.2 No Action Alternative

No effects on geologic and topographic conditions, soils, or prime farmland would be expected.

4.6 WATER RESOURCES

4.6.1 Affected Environment

4.6.1.1 Surface Water

The Monocacy River originates at the state line between Pennsylvania and Maryland, flows approximately 1.5 miles east of Fort Detrick, and empties into the Potomac River approximately 15 miles south of the city of Frederick. Almost all the smaller streams in the region eventually empty into the Monocacy River (U.S. Army, 1991a). Near Fort Detrick, the major tributary to the Monocacy River is Carroll Creek, which flows by Fort Detrick between Areas A and B, then flows through Frederick and empties into the Monocacy River (USAG Fort Detrick, 1998a). Flows in the Monocacy River are seasonal and highly variable, and range between 13 cubic feet per second (cfs) and 1,250 cfs near Frederick. The river's depth ranges from 0.5 feet up to 18 feet, with an average depth of about 5 feet (U.S. Army, 1991a).

The State of Maryland designates Carroll Creek and several other tributaries of the Monocacy River as Natural Trout Waters and Public Water Supply (Use III-P) (COMAR 26.08.02). Water quality standards for Use III-P waters require water quality that is suitable for a safe public water supply, as well as for the growth and propagation of self-sustaining trout populations (USAG Fort Detrick, 1998b).

The Nallin Farm Pond is the only major water feature on Fort Detrick. It is in the northeast corner of Area A and covers about 3 acres. The pond was created when naturally occurring springs were diked in the 1950s (USAG Fort Detrick, 1998b).

Storm water on Fort Detrick drains through a system of surface ditches, inlets, culverts, and storm sewer lines off-post into three tributaries of the Monocacy River, including Carroll Creek. Storm water in the central and western portions of Area A, including the RCI footprint, drains west into Carroll Creek and into the Monocacy River. The surface runoff in the vicinity of Nallin Farm empties into the Nallin Farm Pond and then flows east through an unnamed tributary of the Monocacy River.

Eight sediment/storm water management ponds are on Fort Detrick Area A, three of which are in the vicinity of the RCI footprint. An approximately 40,000- ft² basin is just west of the recently completed MCA housing area. Water drains from this basin to the west off the installation near Old Farm Gate into a tributary of Carroll Creek that flows south paralleling Rosemont Avenue. Another basin is located about 850 feet west of the existing housing area along the installation boundary and adjacent to the NCI-Frederick campus. Water also drains from this basin to the west off the installation into the tributary of Carroll Creek. This pond is designed to handle the 100-year storm event but may have to be reconfigured to comply with quantity and quality MDE regulations (USAG Fort Detrick, 2003b). The third basin is 12,200 ft² in size and serves the AP electrical substation, is also designed to handle the 100-year storm event, and also drains to the west off the installation into a Carroll Creek (Bodenschatz, 2003). All three ponds function as dry detention basins (USAG Fort Detrick, 2003b).

4.6.1.2 Groundwater

The Frederick area is underlain by the Frederick Formation, which contains some of the most productive hard rock aquifers in the state. Most of the wells in the area draw water from fractures or solution channels within calcareous rock such as limestone. However, as is common with karst topography, these fractures are extensively interconnected and have a high potential for groundwater contamination. The groundwater gradient in the immediate vicinity of the installation flows to the southeast (USAG Fort Detrick, 1998b). Groundwater protection is mandated by the Resource Conservation and Recovery Act (RCRA) (40 CFR §§ 261–270), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (40 CFR §§ 300–399), and the Safe Drinking Water Act (SDWA) (40 CFR § 144).

Fort Detrick withdraws an average of 8,000 gallons of groundwater per day from one well in Frederick Limestone near Building 568 in the southwest corner of Fort Detrick Area A. Water withdrawn under MDE Permit No. FR43G-101(03) is used by USACEHR laboratories for research purposes. Trichloroethylene (TCE) was detected in this well in 1987 at levels above the EPA maximum level of 5 parts per billion for drinking water. TCE was once used as a coolant in the USACEHR laboratory, and it likely leached into the groundwater supply. Water from this well is treated to remove the TCE prior to use, and the water cannot be used for human consumption. The presence of TCE does not pose a health risk to residents and workers on Fort Detrick. Groundwater flow is to the southeast in this area, and continuous remedial pumping activities prevent contaminated groundwater from migrating (USAG Fort Detrick, 2003b; 2002d). Three groundwater monitoring wells adjacent to and north of the RCI footprint are located along the Fort Detrick installation boundary between Rosemont Avenue and Frederick Community College. These wells are located upgradient from Building 568, and serve as “background” sampling sites for a baseline comparison with the area affected by TCE. Samples from these wells have met all EPA and MDE water quality standards (USACE, 2000).

4.6.1.3 Floodplains

According to Federal Emergency Management Agency (FEMA) floodplain maps, no floodplains are in the primary housing area portion of the RCI footprint. There is an approximately 150-foot wide floodplain buffer surrounding Nallin Pond; however, this buffer does not overlap the RCI footprint (FEMA, 2002).

4.6.1.4 Appropriated Water

Fort Detrick has a Water Appropriation and Use Permit from MDE to withdraw water from the Monocacy River for its water supply. Water is withdrawn from the Monocacy River at an average rate of 1.4 million gallons per day (mgd). The permitted average daily and maximum daily allocation rates are 2.0 and 2.5 mgd (Silvestri, 2003). For further discussion of potable water sources, see Section 4.11, Utilities.

4.6.2 Consequences

4.6.2.1 Proposed Action

Surface Water. Short- and long-term minor effects on water resources would be expected. In the short term, construction activities might increase erosion as well as dissolved solid, sediment, and petroleum hydrocarbon content in runoff entering Carroll Creek or the Monocacy River. Long-term effects on surface waters would be expected because of the increase in impervious surfaces associated with new housing development. Permeable ground surfaces would be replaced with impervious surfaces such as parking lots, roads, roofs, and sidewalks. An estimated 17.6 acres of new impervious surfaces would be created as a result of the proposed action from the rooftops of 163 new housing units and associated access roads, driveways, and sidewalks.

As imperviousness increases, the potential also increases for nonpoint source pollution, such as oil and grease, metals, nutrients, and bacteria, to discharge into waterways. Implementation of appropriate storm water management controls and BMPs such as low impact development techniques (e.g. vegetated swales, microdetention in landscaping), storm water retention ponds, wetlands, infiltration, filtration, bioretention facilities, open channels, or a combination thereof, would help to mitigate potential adverse effects. Basins constructed for storm water quality recharge to maintain preconstruction infiltration rates and storm water quantity detention designed to handle the 1-, 2-, 10-, and 100-year storm events to protect channel erosion and overbank flood protection would reduce adverse effects from increased storm water runoff discharging into Carroll Creek (Lewis, 2003; USAG Fort Detrick, 2003b).

Storm water management measures are required for projects that disturb more than 5,000 ft² on Federal property according to COMAR 26.17.02 and the *Maryland Stormwater Management Guidelines for State and Federal Projects*. Coordination with MDE will be required for erosion and sediment control and storm water management for the proposed RCI project. The storm water management facilities must be designed consistent with the *2000 Maryland Storm Water Design Manual* Volumes I and II and be constructed in accordance with a project plan approved by MDE. At Fort Detrick, extended wet detention ponds, sand filtration, and open channels are the most feasible options for storm water management because of certain ecologic (West Nile virus), geologic (Karst geology), and climatic (drought) conditions (USAG Fort Detrick, 2003b). GMH would be required to obtain all appropriate permits and implement required storm water management and sedimentation and erosion control measures to ensure that minimal effects would occur from implementation of the RCI project. Discussion of NPDES permit coverage is provided in Section 4.5.2.1.

GMH is planning to construct two storm water management facilities to complement the existing basin just west of the recently completed MCA housing area as discussed in Section 4.5.2.1. The two new basins would be located on-post between proposed Villages 1 and 3, and would have a combined surface area of 105,000 ft².

Effects on potable water supply and wastewater generation are discussed in Section 4.11.2.1, Consequences to Utilities.

Groundwater. Short- and long-term minor adverse effects would be expected for groundwater resources. Karst topography is extremely susceptible to groundwater contamination. Increased waterborne pollutants (e.g., dissolved solids, sediments, petroleum hydrocarbons) in surface waterbodies resulting from construction and demolition activities, and from the increased impervious surfaces following construction, could easily be transported into the groundwater system. Potential effects would be minimized by following protocols outlined in state sediment and erosion control guidelines and the installation's Integrated Contingency Plan.

Floodplains. No effects would be expected. No floodplains are found within the RCI footprint.

4.6.2.2 No Action Alternative

No effects on water resources would be expected.

4.7 BIOLOGICAL RESOURCES

4.7.1 Affected Environment

4.7.1.1 Vegetation

Vegetation in existing housing areas is a mixture of landscaping trees, ornamental shrubs, and maintained lawns. In unimproved areas, Fort Detrick supports grassland, upland forest, and wetland/riparian vegetative communities. Undeveloped portions of the RCI footprint feature

open grasslands that are dominated by tall fescue (*Festuca arundinacea*), alfalfa (*Medicago sativa*), and brome grass (*Bromus* spp.). Three small woodlots managed as “Forest Blocks” by the Fort Detrick Environmental Office are in Fort Detrick Area A. These blocks are about 12 to 14 acres and are remnants of the oak-hickory hardwood forests that once covered the area (USAG Fort Detrick, 2002d). The eastern side of the undeveloped portion of the RCI footprint borders but does not include Forest Block 2. Dominant species in Block 2 are a mixture of native and introduced trees such as pine (*Pinus* sp.), spruce (*Picea* sp.), scarlet oak (*Quercus coccinea*), red oak (*Q. rubra*), and Siberian elm (*Ulmus pumila*) (USAG Fort Detrick, 2003b; USAG Fort Detrick, 1998b).

4.7.1.2 Wildlife

Fort Detrick supports only a limited number of wildlife species because urbanization on the installation and in surrounding lands in Frederick County has reduced the amount of wildlife habitat. Bird and mammal species present near housing areas are those habituated to human disturbance. Common birds include yellow warbler (*Dendroica petchia*), blue jay (*Cyanocitta cristata*), house sparrow (*Passer domesticus*), field sparrow (*Spizella pusilla*), American robin (*Turdus migratorius*), and northern cardinal (*Cardinalis cardinalis*). Mammal species likely to be encountered in the RCI footprint are white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), and fox squirrel (*Sciurus niger*). Currently, a herd of approximately 120 white-tailed deer inhabit Area A and are successfully managed with a bowhunting program (Archibald, 2002; USAG Fort Detrick, 1998b). Fish species found in Nallin Farm Pond include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolmieu*), several species of sunfish (*Lepomis* sp.), rainbow trout (*Oncorhynchus mykiss*), yellow bullhead (*Ictalurus natalis*), golden shiner (*Notemigonus crysoleucas*), and carp (*Cyprinus carpio*) (USAG Fort Detrick, 2003b).

4.7.1.3 Sensitive Species

Highly disturbed natural areas at Fort Detrick provide little habitat for rare plants or wildlife. Consequently, there are no records of federal or state listed rare, threatened, or endangered species of plants or animals within the boundaries of the installation or the RCI footprint. Open fields may provide habitat for declining bird species such as the Savannah sparrow (*Passerculus sandwichensis*) or species listed as endangered in Maryland such as the loggerhead shrike (*Lanius ludovicianus*) or upland sandpiper (*Bartramia longicauda*), although no special status species have been recorded there (USAG Fort Detrick, 2003b; USAG Fort Detrick, 2001d).

4.7.1.4 Wetlands

No wetlands have been identified in the RCI footprint. The nearest wetland to any housing area is wetland area W-5, located approximately 200 feet south of the Nallin Farm House. Wetland area W-5 consists of Nallin Farm Pond, the stream that carries outfall from the pond, and a small fenced area to the west of Nallin Farm Pond Drive (USAG Fort Detrick, 1998b).

4.7.2 Consequences

4.7.2.1 Proposed Action

Long-term negligible to minor adverse and long-term beneficial effects would be expected on vegetation and wildlife. Landscaping vegetation in existing housing areas could be damaged or destroyed during the renovation phases of the RCI project. This would be offset by planting new landscaping using native species once new housing construction has been completed. Unimproved acreage available to wildlife would be reduced from about 300 acres to 240 acres. New housing construction in undeveloped areas would be expected to remove or displace non-

native pasture grasses and some common wildlife species habituated to human disturbance. New housing construction would eliminate up to about 60 acres of foraging habitat for white-tailed deer, which would increase the density of deer foraging in the remaining habitat. No effects would be expected on sensitive species or wetlands because no sensitive species or wetlands have been identified in the vicinity of the RCI footprint. The USFWS has expressed no concerns regarding threatened and endangered species for this project. Copies of coordination letters for this action between Fort Detrick and the USFWS are provided in Appendix D.

Long-term beneficial effects would be expected from afforestation. The Maryland Forest Conservation Act (Natural Resources Article Section 5-1601–5-1613 COMAR) states that any activity requiring an application for a subdivision, grading permit, or sediment control permit on areas 40,000 ft² or greater is subject to the Forest Conservation Act and would require a Forest Conservation Plan (MDNR Forest Service, 2003). Afforestation, or the establishment of tree cover on an area from which it has always or has long been absent, to the equivalent of 15 percent of the total limit of disturbance (up to 61 acres, the total acreage of the undeveloped portion of the RCI footprint), or up to 9.2 acres, would be required elsewhere on Fort Detrick, and approval of a Forest Conservation Plan submitted to the Maryland Department of Natural Resources (MDNR) would be necessary before the project can break ground. The trees planted must be maintained for 2 years so that the minimum 65 percent survivability rate can be ensured (USAG Fort Detrick, 2003b). GMH plans to plant a 50-foot wide tree buffer parallel to and at least 50 feet from the installation boundary north of the Old Farm Truck Gate which would be pursuant to State of Maryland afforestation requirements. The buffer would be planted with 90 percent evergreen and 10 percent deciduous trees native to central Maryland along the northern boundary adjacent to the Clover Hill residential community. An adequate number of 7- to 8-foot trees would be planted 10 feet on center and staggered in two rows as randomly as possible to retain a natural appearance, subject to a detailed landscaping plan currently being developed by GMH. Planting would begin prior to construction activities. In addition to this 4000-foot long buffer, which would partially count toward the afforestation requirements, the trees would create a sufficient barrier to minimize the potential light, visual, and noise disturbances that may result from construction and operation of RCI housing. No forests would be expected to be cleared if the proposed action were implementation.

4.7.2.2 No Action Alternative

No effects on vegetation, wildlife, sensitive species, or wetlands would be expected.

4.8 CULTURAL RESOURCES

4.8.1 Affected Environment

4.8.1.1 Prehistoric and Historic Background

The Fort Detrick Cultural Resources Management Plan (Cannan et al., 1992) contains a detailed description of the prehistoric and historic background for the project area and is thus incorporated by reference.

4.8.1.2 Status of Cultural Resource Inventories and Section 106 Consultations

The Cultural Resources Management Plan inventoried and evaluated all structures on Fort Detrick that were constructed before 1946. Four structures are listed on the National Register of Historic Places (NRHP): the Nallin Farm House and two associated structures, and the One-million Liter Test Sphere. The Nallin Farm House (Building 1652) and its associated bank barn (Building 1655) and spring house (Building 1661) are on the eastern side of the installation. None of these structures are within the RCI footprint. The Test Sphere (Building 527) belongs to the Frederick Cancer Research and Development Center (FCRDC). The historic Stonewall

Jackson Beall House (Building 1401), which is within the RCI footprint in the existing primary housing area, is at the northeast corner of the intersection of Ditto Avenue and Sultan Drive. This house is not listed on the NRHP but has been deemed a structure of historic value and is being preserved and maintained as such by Fort Detrick (Cannan et al., 1992). Figure 4-4 shows the locations of these historic features.

There are 63 post-World War II Capehart housing units in the RCI footprint. In May 2002, the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS) approved a Program Comment that completes the Army's compliance with the National Historic Preservation Act (NHPA) with regard to management of its inventory of Capehart and Wherry era family housing, associated structures, and landscape features. The Program Comment assumes that all Capehart and Wherry-era housing is eligible for the NRHP. This Program Comment allows the Army to proceed with actions involving maintenance and repair, rehabilitation, layaway and mothballing, renovation, demolition, replacement, and transfer, sale, or lease out of federal control all Capehart and Wherry-era housing units without further Section 106 consultation. Near-term actions affecting Capehart and Wherry-era housing units do not preclude the eventual successful completion of the obligations set forth in the Program Comment. These obligations (i.e., mitigation) include revision and expansion of an existing historic context to Capehart and Wherry-era housing, development of design guidelines to be made available to installations and developers, and video documentation of the history and design of this housing type. These efforts are being centrally managed and funded by the Department of the Army and are in progress. The housing units on Fort Detrick have been substantially modified (Canny, 2002) and are not part of the tasks required as part of the NHPA Program Comment compliance (Guldenzopf, 2002).

An intensive Phase I archaeology survey was completed at Fort Detrick in 1993. About 625 acres of the installation were surveyed in areas identified as having high potential for archaeological sites. All the areas within the RCI footprint were tested as part of this survey. One historic period archaeological site, the Stonewall Jackson Beall Site (18FR683), is in the RCI footprint. In addition, although the Nallin Farm House itself is outside the footprint, the Nallin Farm archaeological site (18FR684) may overlap with the RCI footprint. It is an approximately 40 meter (m) by 40 meter area confined to the lawn of the main house. One of the conclusions of the survey was that additional work would be required to determine whether both sites are eligible for listing on the NRHP, if the property is to be affected (Mintz et al., 1993). Table 4-4 lists the historic resources that are found within the RCI footprint.

4.8.1.3 Native American Resources

There are no known Native American resources within the RCI footprint.

4.8.2 Consequences

4.8.2.1 Proposed Action

Long-term minor adverse and beneficial effects on cultural resources would be expected from implementation of the proposed action. Renovation of some existing housing structures and construction of new housing units in undeveloped areas are planned. All areas within the RCI footprint have been surveyed for archaeological resources, and the two historic period archaeological sites would be avoided during construction. However, new construction may cause soil disturbance that has the potential to uncover currently unknown archaeological resources. If unknown deposits or remains were to be discovered during construction, activities would cease until the Fort Detrick cultural resources manager and the Maryland SHPO were contacted and a determination was made regarding NRHP eligibility of the site. If NRHP

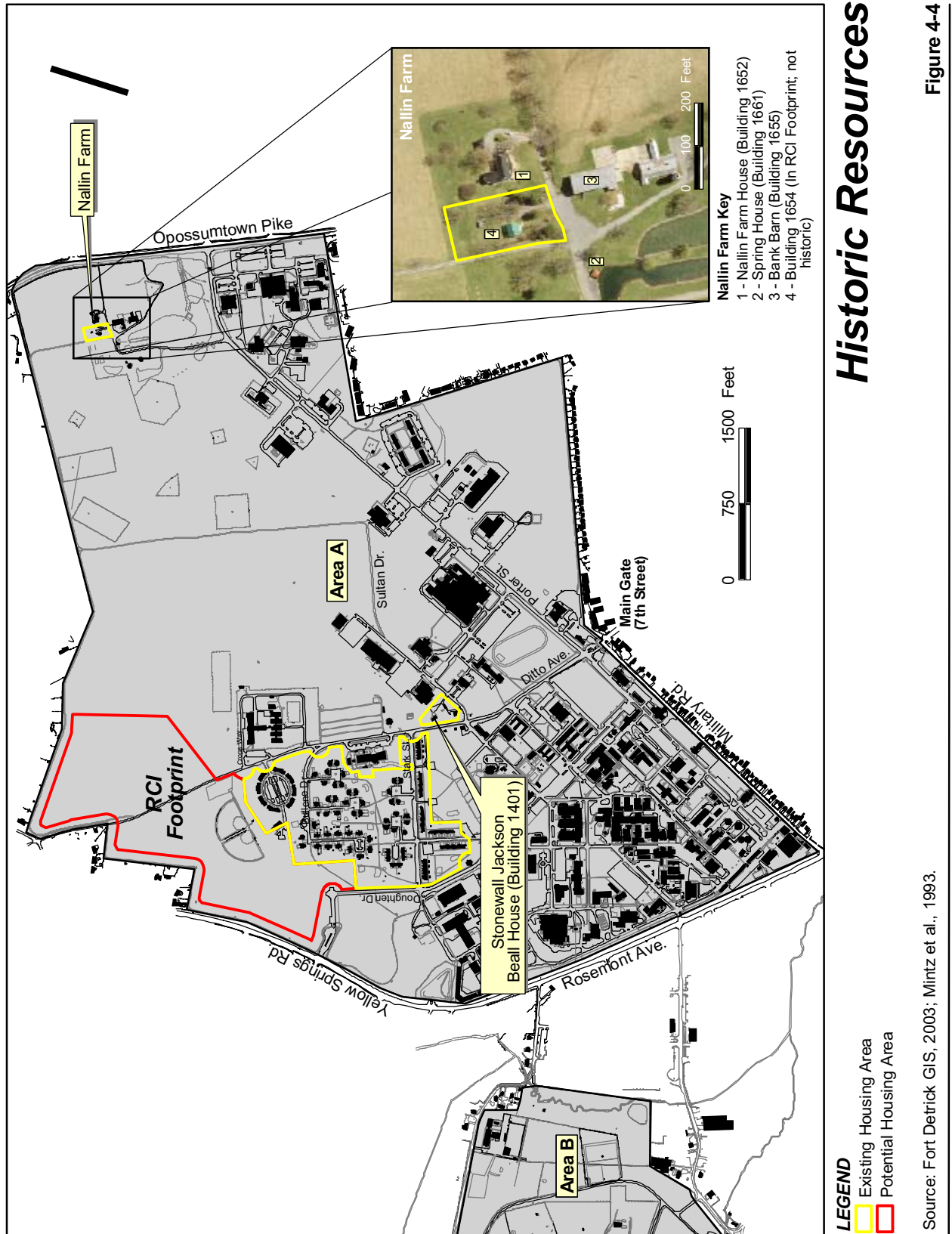


Table 4-4
Historic Resources in the RCI Footprint

Resource	NRHP Eligibility	Resource Description	Potential Effect from Proposed Action	Mitigation
Stonewall Jackson Beall House (Bldg. 1401)	Not Eligible	Early 19th-century historic house	Beneficial	Will maintain
Stonewall Jackson Beall Archaeological Site (18FR683)	Potentially Eligible	Historic site	None if avoided	Will avoid
Nallin Farm Archaeological Site (18FR684) ¹	Potentially Eligible	Historic archaeological site	None if avoided	Will avoid

¹May overlap with the RCI footprint.

Source: Mintz et al., 1993.

eligible, sites would be treated in accordance with procedures outlined in the Cultural Resources Management Plan and in consultation with the Maryland SHPO.

The Stonewall Jackson Beall House (Building 1401) would be maintained so that its historic value is preserved. Building 1654 is expected to continue to be used as a housing unit in the near future; its use in association with a potential Hotel Conference Center in the northeast corner of Fort Detrick is under consideration. The proposed action is expected to have no effect on the Nallin Farm House (Building 1652) located outside the RCI footprint, although minor renovations may occur on Building 1654. The effects of the proposed Hotel and Conference Center project on Nallin Farm would be evaluated under a separate environmental assessment if that project were to move forward. Section 106 consultation with the Maryland Historical Trust has been completed for the proposed action (Appendix D). As a result of this consultation, a *Historic Preservation Covenant for Fort Detrick's Housing Units* would be included in the lease agreement between Fort Detrick and GMH to ensure preservation of the historic structures and archaeological sites within the RCI footprint (Appendix B). Table 4-4 lists these historic resources and potential effects from the proposed action. In addition, Fort Detrick and GMH would review and consider the Capehart and Wherry Neighborhood Design Guidelines when planning renovations that affect the Capehart-era housing, associated structures, and landscape features on Fort Detrick.

4.8.2.2 No Action Alternative

No effects on cultural resources would be expected.

4.9 SOCIOECONOMICS

4.9.1 Affected Environment

This section describes Fort Detrick's contribution to the economy and the sociological environment of the region. The socioeconomic indicators used for this study include industry, employment, and population. These indicators characterize the region of influence (ROI).

An ROI is a geographic area selected as a basis on which the social and economic impacts of project alternatives are analyzed. The criteria used to determine the ROI are the geographic location of Fort Detrick, the residency distribution of Fort Detrick military and civilian personnel, commuting distances and times, and the location of businesses providing goods and services to Fort Detrick, its personnel, and their dependents. Based on these criteria, the ROI for the social and economic environment is defined as Frederick County, Maryland. About 88 percent of all military families with local permanent addresses reside in Frederick County (principally the city of Frederick, where 46 percent of all military personnel reside) (Robert D. Niehaus, Inc., 2001).

The baseline year for the socioeconomic analysis is 2000, the most recent year for which socioeconomic indicators for Fort Detrick are available. Where 2000 data are not available, the most recent data available were used.

4.9.1.1 Regional Economic Development and Demographics

Population. The population of the ROI in 2000 was 195,277, an increase of 30 percent over the 1990 ROI population of 150,208 (U.S. Census Bureau, 2000; 2002). Most of this growth can be attributed to a significant expansion of the Washington, D.C., and Baltimore regional economies and a large in-migration of a commuter force from these metropolitan areas (USAG Fort Detrick, 2000). The city of Frederick was a large component of the 30 percent growth in Frederick County. The city's population increased by 31 percent between 1990 and 2000, accounting for 27 percent of Frederick County's total population (City of Frederick Planning Department, 2002). Demographic projections indicate that the ROI population will exceed 281,000 by the year 2020, a 44 percent increase from 2000 (Frederick County Division of Planning, 2002).

Employment. The ROI civilian labor force totaled 102,592 in 2000 (Maryland LMI, 2002). The primary sources of employment in the ROI were services, retail trade, government, and construction, which together accounted for almost 73 percent of total employment. Approximately 31 percent of all jobs were in the services sector, the retail trade sector accounted for 18 percent, government and government enterprises accounted for 14 percent, and 10 percent of employment was in the construction industry (USDOC, BEA, 2002a). Fort Detrick (including NCI) employs about 7,100 people, of whom 1,463 are enlisted personnel. The unemployment rate for the ROI was 2.9 percent in 2002, lower than the national unemployment rate of 5.8 percent (USAG Fort Detrick, 2003b).

Income. ROI per capita personal income (PCPI) in 2000 was about \$32,000, an increase of 52 percent since 1990. The PCPI of the ROI was slightly higher than the national PCPI of \$29,000 (USDOC, BEA, 2002b).

4.9.1.2 ROI Housing

On-Post Family Housing. There are 191 existing family housing units at Fort Detrick. With the exception of 36 housing units constructed in 2003, the existing units were built before 1967. Some units barely meet minimum square footage requirements, and many units lack amenities such as family rooms, laundry/utility space, adequate exterior storage, and auxiliary eating areas such as eat-in kitchens or breakfast nooks. The existing family housing areas are described in Section 2.2.1.2. Demand for Fort Detrick's on-post family housing currently exceeds supply. The installation's permanent-party military personnel totaled 1,521 in 2001—537 single soldiers, 44 military couples, and 940 military families (Robert D. Niehaus, Inc., 2001). However, the number of active duty personnel living on the installation in both family housing and barracks in FY 2001 was 356. Of the active duty personnel living on Fort Detrick, 27 are not stationed at Fort Detrick but at other locations, such as the Walter Reed Army Medical Center in Washington, D.C.; the Marine Corps Recruiting Station in Frederick, Maryland; Fort Ritchie, Maryland; and

Camp David, Maryland. Of the 27, seven commute to their duty stations in the Washington, D.C., metro area.

The 191 family housing units on Fort Detrick have a 99 percent occupancy rate. On average, 112 enlisted personnel are on the waiting list for on-post family housing. The average wait for a three-bedroom unit exceeds 16 months (USAG Fort Detrick, 2002c).

Off-Post Housing. Uniformed personnel living off-post are given a basic allowance for housing (BAH). BAH is listed on a soldier's paystub as an entitlement, or allotment, and is non-taxable income for paying rent or a mortgage. However, current DoD policy does not mandate that BAH meet all housing costs for uniformed personnel and their families. If necessary, each member is expected to pay an "out-of-pocket" (OOP) amount to meet additional housing costs, such as utilities. The sum of BAH and OOP equals the maximum acceptable housing cost (MAHC). Table 4-5 lists BAH, OOP, and MAHC by rank for 2001. If a military member finds it necessary to pay more than MAHC to obtain adequate housing, that member is, by definition, in unacceptable housing. For Fort Detrick, MAHC ranges from \$885 per month to \$1,542 per month depending on pay grade. Based on current DoD guidance, it is assumed that OOP will be reduced to zero by 2006 and BAH rates will increase to reflect MAHC within the market area (Robert D. Niehaus, Inc., 2001).

Rents for the Frederick area are close to the national average and approximately equal the BAH, which pays for close to 100 percent of the costs for off-post housing (USAG Fort Detrick, 2002c). However, it is possible that BAH may not be sufficient to cover the cost of off-post housing. Table 4-6 lists information on rental rates for off-post housing in the ROI and surrounding communities, including Germantown, Gaithersburg, Hagerstown, and Montgomery Village, Maryland; and Gettysburg and Waynesboro, Pennsylvania. Comparing the BAH in Table 4-5 to the cost of housing in Table 4-6 shows that military personnel living off-post could possibly have housing costs greater than their BAH.

About 71 percent of active duty personnel live off-post (USAG Fort Detrick, 2002c). The Community Home Finding, Relocation, and Referral Services Office maintains a list of available homes for rent or purchase in the Frederick area (Fort Detrick PAO, 2001). Fort Detrick relies on the city of Frederick and neighboring communities to provide the majority of suitable family housing for military personnel. There is no shortage of housing in the city of Frederick (USAG Fort Detrick, 2002c). Since the 1980 Census, the number of housing units in the county has been increasing at a rate faster than population growth. The number of dwellings in Frederick County increased by approximately 2,000 units annually throughout the 1990s. While the majority of

Table 4-5

BAH, OOP, and MAHC Levels for Fort Detrick, 2001¹

Pay Grade	BAH	OOP	MAHC
E1 to E3	\$769	\$116	\$885
E4 to E6	\$842	\$134	\$976
E7 to E9	\$1,022	\$166	\$1,188
W1 to O3	\$1,035	\$173	\$1,208
W4 to O5	\$1,257	\$209	\$1,466
O6+	\$1,323	\$219	\$1,542

¹ E = enlisted; W = Warrant Officer; O = Officer; BAH = basic allowance for housing; OOP = out-of-pocket; MAHC = maximum acceptable housing cost.

Source: Robert D. Niehaus, Inc., 2001.

Table 4-6

Off-Post Housing Market Cost Information

Type of Housing	Median Monthly Rent (min-max)	Average Monthly Utility Cost	Total Average Monthly Housing Cost
Two bedrooms	\$795 (\$375-\$1,500)	\$114	\$909
Three bedrooms	\$950 (\$500-\$2,450)	\$160	\$1,110
Four or more bedrooms	\$1,400 (N/A) ¹	\$213	\$1,613

¹ Note: N/A = not available.

Source: Robert D. Niehaus, Inc., 2001.

housing units being built are still single-family dwellings, the number of multifamily and townhouse units is becoming a larger percentage of the housing stock (Frederick County Division of Planning, 2002). The average number of dwelling unit permits issued annually by the City of Frederick from 1980 to 2000 was 566, and from 1997 to 2000, the average number of permits issued annually was 772.

4.9.1.3 Quality of Life

Law Enforcement Services. The Provost Marshal Office (PMO) and DoD civilian police handle the law and order functions for the installation from the Fire and Police Building on Porter Street. These functions include law enforcement, traffic and visitor control, prevention and investigation of crimes, physical security, and vehicle, pet, bicycle, and weapon registration (Fort Detrick PAO, 2001).

Fire Protection Services. Fort Detrick Fire and Emergency Services (F&ES) has 25 full-time firefighters operating out of one station on Fort Detrick. The department provides fire protection, public fire education, crash fire and rescue, emergency medical services, confined space rescue, and hazardous materials incident mitigation for the installation. Fort Detrick F&ES mutual aid response areas include portions of the city of Frederick for suppression activities, and Frederick County and vicinity for hazardous material incident response (Fort Detrick F&ES, 2002).

The Fort Detrick F&ES is in Building 1504 in the southcentral portion of Area A. The existing fire station will be demolished and renovated, and a new apparatus room consisting of five drive-through bays will be added west of the building. Construction is scheduled to begin in mid-2004. The larger fire station will meet current USACE design criteria and will be better equipped to service Fort Detrick's fire prevention and protection needs well into the future (USAG Fort Detrick, 2003b).

Health and Safety Services. Fort Detrick's Installation Safety Office establishes guidelines and procedures to provide a safe and healthful work and living environment free from recognized hazards that are likely to cause death or serious physical harm. The Safety Office's programs and actions include inspections and surveys for activities ranging from industrial operations to Family Child Care Provider home inspections to recreational activities (USAG Fort Detrick, 2003c).

Medical Services. The Fort Detrick Richard Barquist Army Health Clinic provides general medical care for active duty, active duty family members, retired, and retired family members. Emergency care is available at Frederick Memorial Hospital, located 1 mile from Fort Detrick (USAG Fort Detrick, 2002e). Frederick Memorial Hospital is a modern primary-care facility featuring modern diagnostic and treatment equipment (Fort Detrick PAO, 2001).

Schools. The U.S. Department of Education provides federal impact aid to school districts that have federal lands within their jurisdiction. This federal impact aid is authorized under Public

Law 103-382 as payment in lieu of taxes that would have been paid had the land not been held by the federal government. Because federal lands are not subject to local taxation, impact aid is intended to compensate for the loss of tax revenue, including revenue that would be dedicated to educational services (Antonelli and Sperry, 2001). School districts receive federal funding for each student whose parent or parents live on or work on federal property. The amount of federal school aid a school district receives is dependent on the number of “federal” students the district supports. Schools receive more funding for those students whose parents both live and work on federal property. Total funding varies year by year according to congressional appropriations for the program, but in general funding has ranged from \$200 to \$2,000 per pupil.

Fort Detrick has no elementary or secondary schools on-post. Most of the children living on- and off-post attend the Frederick County Public Schools (FCPS). FCPS received \$116,500 in federal impact aid for the 2002–2003 school year (Tuggle, 2002).¹ Some federal students also qualify for free or reduced-price lunches, depending on the family’s income.

FCPS has 56 schools scattered throughout the county (FCPS, 2002). Because of the county’s high population growth over the last decade, 23 of the schools are operating beyond capacity and use portable structures to provide additional classroom space. The three schools that serve Fort Detrick students (Whittier Elementary, Governor Thomas Johnson Middle School, and Governor Thomas Johnson High School) are among the 23 schools over capacity. To accommodate the fast-growing student population, the FCPS Master Plan has scheduled eight new schools to be built (four elementary, two middle, and two high schools) and six schools to be expanded between 2003 and 2007. The first new school is Tuscarora High School, which opened in August 2003 (FCPS, 2003). When this new high school opened, redistricting took place that will affect Fort Detrick students. Young children on-post will still attend Whittier Elementary School, and older students will move to West Frederick Middle School and Frederick High School. The capacity of Frederick High School is currently 128 percent; capacity is expected to drop to about 82 percent following redistricting. Planned new residential development within the Frederick High School district would eventually bring the capacity of the school up to about 88 percent (Tuggle, 2002).

Post-Secondary Education. There are several opportunities for higher education within the ROI. Frederick Community College is a 40-year-old facility adjacent to and north of Fort Detrick. Hood College is a private liberal arts college in Frederick offering degrees in 25 fields of study. Mount Saint Mary’s College and Seminary, also a liberal arts college, is in northern Frederick County in Emmitsburg, Maryland (Fort Detrick PAO, 2001).

Family Support. The Army Community Service (ACS) provides Fort Detrick soldiers, retirees, and family members with a centralized source of information, guidance, and assistance in solving personal problems. Among the services provided by ACS are the Family Advocacy Program, which focuses on preventing and treating child and spouse abuse; the Financial Readiness Program, which offers various financial management training such as budgeting, credit and check writing principles, and consumer education; and the Employment Readiness and Transition Program, which provides comprehensive employment and transition programs to enhance the military family’s wellness and assist the military member in pursuing a career change (Fort Detrick PAO, 2001).

¹ The amount of federal impact aid per student was not available. There are three levels of federal impact aid. “Military A” students are dependents of military employees residing on federal property. “Military B” students are dependents of military employees not residing on federal property. “Civilian B” students do not reside on federal property but have a parent employed on federal property. Military A students receive the highest amount of funding, and Civilian B students receive the lowest level of funding.

Shops and Services. The Fort Detrick commissary is a full-service commissary carrying more than 6,000 line items, including national products at reduced prices. There are also a PX, barbershop, auto service center, car wash, laundry and dry cleaner, military clothing store, Class Six store, thrift shop, and several dining facilities on the installation (Fort Detrick PAO, 2001). The commissary, PX, and dining facilities are not deemed to be large enough to serve Fort Detrick's growing population (USAG Fort Detrick, 2001c). Plans have been proposed to correct these deficiencies, as discussed in Section 4.1.1.2.3.

Outside the installation, the city of Frederick offers a variety of restaurants, shops, and antique shops, as well as a movie theater, a center for the arts, and a shopping mall (Fort Detrick PAO, 2001). Fort Detrick is also within 50 miles of Washington, D.C., and Baltimore.

Recreation. Fort Detrick has a variety of recreational facilities on the installation. There is a bowling alley; a fitness center with a wide variety of fitness equipment, volleyball and basketball courts, softball/baseball fields, saunas, aerobic classes, and locker room facilities; a jogging trail; outdoor tennis courts; and an outdoor swimming pool (Fort Detrick PAO, 2001). The Fort Detrick 2001 Installation Status Report (ISR) identified a shortage of community support recreational facilities. An objective was incorporated into the Fort Detrick Strategic Plan for the establishment of a community park that would provide a youth baseball field (see Section 4.1.1.2.3). However, this would help to alleviate, but not eliminate, the current deficit (USAG Fort Detrick, 2001b).

Homeless and Other Special Programs. The region has a number of shelters and assistance programs for individuals and families in need of temporary placement because of a lack of fixed, regular, or adequate residence. A mixture of government and private funding supports these programs.

4.9.1.4 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. The Executive Order is designed to focus the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities. Environmental justice analyses are performed to identify potential disproportionately high and adverse impacts from proposed actions and to identify alternatives that might mitigate these impacts. Minority populations included in the census are identified as Black African American, American Indian and Alaska Native, Asian, Native Hawaiian and other Pacific Islander, Hispanic, of two or more races, and other. Poverty status, used in this EA to define low-income status, is reported as the number of persons with income below the poverty level. The 2000 Census defines the poverty level as less than \$8,794 and \$17,603 of annual income for an individual and a family of four, respectively.

According to 2000 Census data, 89.3 percent of Frederick County's population is Caucasian, 6.4 percent is Black African American, 0.2 percent is American Indian or Alaska Native, 1.7 percent is Asian, 0.9 percent is of another race, 1.5 percent is of two or more races, and 2.4 percent is of Hispanic or Latino origin (U.S. Census Bureau, 2002).

4.9.1.5 Protection of Children

Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*, requires federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children.

Children are present at Fort Detrick as residents and visitors, particularly in housing areas. The Army has taken precautions for their safety by a number of means, including, but not limited to,

the use of fencing, limitations on access to certain areas, and provision of adult supervision. Fort Detrick Regulation 608-10 provides for the supervision of children 18 years of age and younger. Children under 14 years of age must be inside between 9 p.m. and 6 a.m., and children 14 to 17 years of age must be inside between 11 p.m. and 5:30 a.m. This regulation applies to all military and civilian personnel and their family members while on Fort Detrick (USAG Fort Detrick, 1995).

Previous investigations identified hazardous substances (ACM and LBP) present in or around family housing units on Fort Detrick, as discussed in Section 4.12. These materials were widely used in the building products industry and for housing maintenance for many years. However, the materials have been or are scheduled to be abated from all family housing units by the end of FY 2003 (Cole, 2001).

4.9.2 Consequences

4.9.2.1 Proposed Action

Regional Economy

Methodology. Economic effects of implementing of the Preferred Alternative are estimated using the Economic Impact Forecast System (EIFS) model. The EIFS model is a computer-based economic tool that calculates multipliers to estimate the direct and indirect effects resulting from a given action. Changes in spending and employment represent the direct effects of the action. Based on the input data and calculated multipliers, the model estimates ROI changes in sales volume, income, employment, and population, accounting for the direct and indirect effects of the action.

For purposes of this analysis, a change is considered significant if it falls outside the region's historic range of economic variation. To determine historical variability, the EIFS model calculates a rational threshold value (RTV) profile for the ROI. This analytical process uses historical data for the ROI and calculates fluctuations in sales volume, income, employment, and population patterns. The historical extremes (positive and negative) for the ROI become the thresholds of significance (i.e., the RTVs) for social and economic change. If the estimated effect of an action falls above the positive RTV or below the negative RTV, the effect is considered to be significant. Appendix E discusses this methodology in more detail and presents the model's input and output tables developed for this analysis.

EIFS Model Results. Short-term direct and indirect minor beneficial effects would be expected. In the short-term, the expenditures and employment associated with construction of family housing and associated facilities at Fort Detrick would increase sales volume, employment, and income in the ROI, as was determined from the EIFS model (Table 4-7 and Appendix E). The economic benefits would be temporary, lasting only for the duration of construction. These changes in sales volume, employment, and income would fall within historical fluctuations and be considered minor.

Housing. Long-term minor beneficial effects on local area housing would be expected. Beneficial effects would result from the construction of new family housing on Fort Detrick, which would help to relieve the deficit of on-post family housing. The availability of affordable, quality housing in family-oriented communities is a key issue for Army recruiting and retention. Of the 354 end state housing units under RCI, 292 would be newly constructed and 62 would be renovated. This would allow more military families to have quality housing with modern amenities that suits the needs of today's families. The rent for the new and revitalized on-post housing would not exceed a soldier's BAH.

Table 4-7
EIFS Model Output for the Proposed RCI Action at Fort Detrick

Indicator	Projected Change	Percentage Change	RTV Range
Direct Sales Volume	\$24,300,000		
Induced Sales Volume	\$30,892,520		
Total Sales Volume	\$46,899,000	0.6%	-7.3% to 17.4%
Direct Income	\$2,715,305		
Induced Income	\$5,240,538		
Total Income	\$7,955,843	0.2%	-6.2% to 12.8%
Direct Employment	66		
Induced Employment	127		
Total Employment	192	0.2%	-4.8% to 7.8%
Local Population	0	0.0%	-1.4% to 1.8%

Military personnel transferring from off-post housing to on-post housing could increase the number of vacant housing units in the ROI. However, demographic projections indicate that the ROI population will increase 44 percent between 2000 and 2020. Because of the projected high population growth, the civilian population would be expected to fill the off-post units vacated by military personnel.

The proposed new Village 1 would be a compatible land use with an adjacent off-post residential neighborhood to the north (Clover Hill). The homes in Village 1 would be higher density townhomes, compared to the single-family ranch-style housing in the off-post neighborhood. The townhomes would be newly constructed in an aesthetically pleasing design with Colonial-style facades. GMH would maintain the housing in like-new conditions, would have whole-house renovations every 20 years, and would maintain the common areas.

Quality of Life. Long-term beneficial and short-term minor adverse effects on quality of life would be expected. Overall quality of life for soldiers and their families would be greatly improved through implementation of the RCI program at Fort Detrick, although some short-term adverse effects would also result. The following identify the anticipated effects for each of the key components of quality of life:

Law Enforcement and Fire Protection. No effects on law enforcement and fire protection would be expected. Although the housing units would be sold to GMH, the land on which the buildings would stand would only be leased to the developer (the land would continue to be federal government property). Therefore, Fort Detrick would retain legislative jurisdiction. The Fort Detrick police and F&ES would still respond to emergencies in the Fort Detrick housing areas. An increase in the number of residents on Fort Detrick would be expected to increase the number of emergency calls from the housing areas for fire. However, it is expected that the law and fire department resources would be able to handle the anticipated increase. F&ES would have sufficient personnel and equipment to maintain required emergency response times (Eskildsen, 2003). RCI should not have an impact on existing mutual aid agreements, nor would it require the establishment of new mutual aid agreements.

Health and Safety Services. No effects would be expected. Fort Detrick's Installation Safety Office would be expected to continue to provide safety inspections and oversight on RCI construction activities and for recreational facilities during the RCI operational phase.

Medical Services. No effects on medical services are anticipated. Implementation of RCI would not change the eligible population of active duty military, military dependents, or retirees within the region serviced by on-post and civilian facilities.

Schools. Long-term minor beneficial and short-term adverse effects would be expected. Fort Detrick does not have a primary or secondary school on-post. All school-age children of Fort Detrick soldiers moving from off-post to on-post would continue to attend FCPS, but their status would change from Military B students to Military A students. Therefore, in the long term, FCPS would receive beneficial effects from the higher level of funding for these students. It is estimated that an additional 229 school-age children would be able to move on-post (155 elementary, 40 middle, and 34 high school students).

By the time the RCI project would be completed, Fort Detrick students would attend Whittier Elementary School, West Frederick Middle School, and Frederick High School. Whittier Elementary and West Frederick Middle School are expected to be at or above capacity, whereas Frederick High School is expected to be at about 82 percent capacity as a result of redistricting by FCPS. Under the proposed action, the elementary and middle schools would continue to be at or beyond capacity, depending on the number of children moving on-post, and whether the children would be transferring from other elementary and middle schools to Whittier and West Frederick. In the short term, children would attend overcrowded elementary and middle schools. However, FCPS is in the process of building eight new schools (four elementary, two middle, and two high schools) between 2003 and 2007 to help alleviate overcrowding and accommodate the growing student population.

Family Support Services. No effects on family services are anticipated. The eligible population of active duty military, dependents, and retirees within the region would not change.

Shops and Services. No effects would be expected. Fort Detrick has a comprehensive plan for increasing and improving services on the installation, including constructing a new PX and commissary. These new facilities should be complete before the RCI initial development period is complete, and would compensate for the increase in demand for on-post shops and services.

Other Quality of Life Issues. No effects on recreation or homeless and other special programs would be expected to result from implementation of the proposed action. The population of the ROI would not change. These service facilities would continue to supply the same number of civilian and military personnel, whether they live on- or off-post.

Recreation. Long-term minor beneficial effects would be expected. The RCI program would include the construction of two community centers in the new housing areas. The community centers would have meeting rooms, exercise rooms, a video/paperback library, and sport courts (e.g., basketball, volleyball). Additional outdoor recreational facilities would also be constructed, including playgrounds/tot-lots, a swimming pool and playground, and outdoor sport courts. A system of pedestrian/bike trails would connect the housing to central green spaces, play areas, and the community centers.

Environmental Justice. No effects would be expected. There would be no disproportionately high or adverse human health or environmental effects on minority or low-income populations as a result of the proposed action. The construction of new housing on Fort Detrick would not cause adverse human health or environmental effects on minorities in the ROI or on persons in the ROI living in poverty.

Protection of Children. Short-term minor adverse effects on the protection of children would be expected. In the short term, because construction sites can be enticing to children, construction activity could be an increased safety risk. During construction, safety measures stated in 29 CFR 1926, Safety and Health Regulations for Construction, and Army Regulation 385-10, Army Safety Program, would be followed to protect the health and safety of residents on Fort Detrick as well as construction workers. It is recommended that barriers and “no trespassing” signs be placed around construction sites to deter children from playing in these areas, and that construction vehicles and equipment be secured when not in use.

No effects on children would be expected from exposure to hazardous materials. All known hazardous materials have been or are scheduled to be abated from the housing units on an ongoing basis (see Section 4.12). New construction would not use building products containing hazardous materials. These actions would largely eliminate the exposure of children to these hazardous materials in on-post family housing.

4.9.2.2 No Action Alternative

Economic Development and Demographics. No effects would be expected. There would be no change in sales volume or employment in the ROI as a result of the no action alternative, and no change in population.

Housing and Quality of Life. Long-term minor adverse effects would be expected. Continuation of the present family housing programs would perpetuate deficiencies in quality of life for many soldiers and their dependents. Availability of affordable, quality family housing is a key function of quality of life and is often given high priority by soldiers and their families. The Army would continue to do regular maintenance on existing housing, as well as some renovation and demolition, but these activities would be on a constrained budget over approximately a 30-year period. Over the years, some housing units would deteriorate to the point that they would become unsuitable for living. This would further decrease the inventory of family housing on Fort Detrick, forcing military employees and their families to find housing off-post, which could strain the financial resources of the family. Depending on the rank and number of dependents of military employees, they might have to pay more than their BAH to afford off-post housing that fits their family’s needs.

No effects on law enforcement, fire protection services, medical services, family support services, shops and services, recreation, or homeless and other special programs are likely to result from implementation of the no action alternative. There would be no change in the number or location of populations using these facilities.

Environmental Justice. No effects would be expected. There would be no disproportionately high or adverse human health or environmental effects on minority or low-income populations as a result of implementing the no action alternative.

Protection of Children. No effects on children would be expected from exposure to hazardous materials. All known hazardous materials have been or are scheduled to be abated from the housing units on an ongoing basis (see Section 4.12).

4.10 TRANSPORTATION

4.10.1 Affected Environment

Transportation in and around the Fort Detrick installation is achieved primarily via road networks and pedestrian walkways. The following discussion describes these transportation resources, their relative use, and their importance to the surrounding community.

4.10.1.1 Roadways and Traffic

On-Post Roads. All roadways throughout Fort Detrick are classified as primary, secondary, or tertiary according to their relative importance and function as part of the roadway network. Primary roadways include all installation roads and streets that serve as the main distribution arteries for all traffic originating outside and within the installation and that provide access to, through, and between various functional areas. Secondary roadways include all installation roadways and streets that supplement the primary roadways by providing access to, between, and within the various functional areas. Tertiary roadways include all installation roadways and streets that supplement the secondary roadways. Primary and secondary roads will be discussed, as they are the most frequently used roadways on the installation.

The primary roadways on Fort Detrick are Ditto Avenue and Porter Street. Ditto Avenue begins at the Main Gate, runs north-south across the installation, and ends at the north border of Fort Detrick. This roadway has one lane of traffic in each direction and carries about 5,300 vehicles per day (VPD). Porter Street runs east-west across the installation with one lane of traffic in each direction and carries about 3,900 VPD. Ditto Avenue intersects with Porter Street just inside the Main Gate approximately 200 feet north of Military Road, which runs parallel to and outside of the southern boundary of the installation. The majority of primary roadways within the post do not meet the standards set forth in the *Installation Design Guide* (IDG) (USAG Fort Detrick, 1991). Both Porter Street and Doughten Drive (which runs in a north-south direction and extends along the western boundary of the housing area to the Old Farm Gate) are narrow and have on-street parking along portions of their length. Ditto Avenue is wide only near the Main Gate and narrows after that point; however, there is no on-street parking the entire length of Ditto Avenue. All the primary roadways have both open (no curb) and closed (curb) sections. Bicycle facilities are scattered throughout the post (STV, 2003).

Secondary roadways on the installation include Randall Street, Freedman Drive, and Nelson Street. Randall Street is a two-lane north-south street intersecting with Porter Street east of Ditto Avenue. Freedman Drive is a one-way pair street that intersects Porter Street at two "T" intersections. Freedman Drive serves the commissary, central warehouse, and the barracks complex south of Porter Street. Nelson Street serves the 1110th Signal Battalion. Stark Street and Ballene Drive are additional secondary streets that provide access to the housing area (USAG Fort Detrick, 1998b). The majority of secondary roadways at Fort Detrick meet the criteria set in the IDG. These roadways are narrower and are clearly defined (STV, 2003).

The speed limit is 25 mph on most roadways within the post. The speed limit is reduced to 15 mph along Sultan Drive between Doughten Drive and Gardner Street near the CDC and various recreational facilities, and along Ditto Avenue in the vicinity of the church (STV, 2003).

Planned road construction projects on Fort Detrick include a new road extension to the Commissary, reconfiguration of the Main Gate and nearby road improvements, construction of a remote truck inspection station at the Old Farm Truck Gate, improvements to the Opossumtown Gate, and development of road infrastructure for the Biomedical Research Campus (STV, 2003).

Access from Off-Post Highways and Roads. Fort Detrick can be reached via a number of interstate and U.S. highways, including Interstate 70 (I-70), I-270, U.S. 40, U.S. 340, and U.S. 15. I-270 and other major roadways that run through the city of Frederick provide convenient access to Baltimore and Washington, D.C. Local access to the installation occurs via the surrounding roadway network of city streets, county roads, and state highways. U.S. 15 is a two-lane divided highway serving both regional and local commuter traffic in the city of Frederick. This highway, also known as the Frederick Bypass, runs approximately one-half mile southeast of Fort Detrick. The Frederick Bypass has interchanges at West 7th Street, Rosemont Avenue, and Opossumtown Pike. West 7th Street is a minor north-south artery that approaches Fort Detrick Area A from the

south and serves as the primary access route to Area A via the Main Gate, which serves as the only full-access, 24-hour gate for employees and all installation visitors (with the exception of trucks, which must use the Old Farm Truck Gate). On-street parking is restricted near the Main Gate, and all northbound, non-post traffic, must turn left onto Military Road. As motorists enter this gate, visitors must veer right into the vehicle inspection area while decal vehicles travel straight onto the post. Left turns from Military Road into the post have been prohibited. A peak period turning movement count was conducted in January 2003. The 8-hour volume entering and exiting the Main Gate was 6,337 vehicles (STV, 2003).

Rosemont Avenue is a major artery serving north-south travel in Frederick and forms the western boundary of Area A. There are two access gates to Area A off Rosemont Avenue—Rosemont Gate, which is currently closed, and the Old Farm Truck Gate, which is farther north on Rosemont Avenue. This gate permits vehicles with DoD decals and serves as the only truck and commercial vehicle access point into Area A. Fort Detrick is bordered to the east by Opossumtown Pike, a major four-lane north-south artery. Installation access from this road is permitted for vehicles with DoD decals only via the Opossumtown Gate. Military Road, a minor east-west artery, forms the southern boundary of Area A (USAG Fort Detrick, 1998a).

An I-270/U.S. 15 transportation study is currently being conducted by the Federal Highway Administration and Maryland State Highway Administration. Several combinations of transit and highway strategies are being evaluated in an effort to reduce congestion and increase safety, including general-purpose lanes, auxiliary lanes, high occupancy vehicle (HOV) lanes, collector-distributor lanes, light rail transit, and bus rapid transit (USDOT-FHA and MDOT, n.d.).

4.10.1.2 On-Post Traffic

The existing road network is generally capable of serving the needs and mission of Fort Detrick, although minor traffic problems do exist.

Level of Service (LOS) is a way to measure traffic levels by calculating the ratio of roadway traffic volume to capacity (V/C). Six LOSs are defined and range from LOS A, the best traffic flow, to LOS F, the most inefficient traffic flow. Segments of roadway that are listed below LOS D and have a volume-to-capacity ratio that reaches or exceeds a value of 0.8 experience unstable and forced flow of traffic for significant periods of the day, creating unacceptable delays, increased accident frequencies, and increased pollution emissions.

A detailed study of the transportation system on Fort Detrick and the key external intersections serving the installation was performed in 1995. Results indicated that all the intersections studied operated at an acceptable LOS with the exception of the Main Gate intersections during evening peak periods. Traffic problems occur at the Main Gate during rush hour periods because of its design and location. The Main Gate is located between two stop-controlled intersections: the intersection of West 7th Street and Military Road, just outside the Main Gate, and the intersection of Ditto Avenue and Porter Street just inside the Main Gate, about 200 feet north of Military Road. Throughout most of the day these intersections operate well with little delay, including during the morning peak period when inbound traffic dominates, although traffic backup occurs off-post onto 7th Street. However, when traffic patterns are reversed during the afternoon peak, long queues form, delays are lengthy, and the intersections operate over capacity, resulting in LOS F conditions. To ease the congestion at the Main Gate during the afternoon peak, security personnel sometimes provide manual traffic control (USAG Fort Detrick, 2002c).

Another study of the transportation system in the vicinity of Fort Detrick was performed in 2003, in which 15 on- and off-post study intersections were identified to analyze the traffic impact of new development at Fort Detrick. Peak A.M. and P.M. LOS results of the seven intersections in

the study that are on-post or are adjacent to Fort Detrick are presented in Table 4-8. Two off-post intersections along Rosemont Avenue are currently operating at an unacceptable LOS—Military Road/Baughmans Lane and Montevue Lane. Although the LOS at the Main Gate was deemed acceptable according to this study, queues for on-post access back up onto 7th Street and can block vehicles turning left from 7th Street onto Military Road (STV, 2003).

4.10.1.3 Installation Transportation

The installation has no fixed wing aircraft landing facilities. Fort Detrick has a helipad in Area A southwest of the commissary, which is used infrequently for emergency air evacuation of medical patients and for very important persons. Fort Detrick does not have bus, taxi, rail, or water transportation facilities on-post.

4.10.1.4 Public Transportation

Air. The Frederick Municipal Airport is 3 miles from Fort Detrick and provides limited commercial passenger and cargo service. Service is also available at the Hagerstown Municipal Airport. International airports in the region are Baltimore-Washington International Airport (BWI), Ronald Reagan Washington National Airport (DCA), and Washington Dulles International Airport (IAD).

Buses. Fort Detrick is served by the Frederick Bus System. The east-west Blue Line provides service between downtown Frederick and the Main Gate at Fort Detrick. The bus runs at hourly intervals from 6:00 a.m. to 8:00 p.m. The Blue Line also connects passengers to the Maryland Rail Commuter (MARC) bus station in downtown Frederick. In addition, Greyhound Lines, Inc. provides inter-regional transportation services out of Frederick at the MARC train station.

Rail. Frederick is served by a passenger rail system. A spur to the MARC Brunswick Line near Point of Rocks, Maryland, provides service from Frederick to Washington, D.C. and West

Table 4-8
Peak A.M. and P.M. LOS for Selected Intersections on or near Fort Detrick

Intersection	A.M. Peak LOS	P.M. Peak LOS
On-post or installation gate intersections		
Ditto Avenue and Porter Street	B	B
7th Street/Ditto Avenue and Military Road (Main Gate)	A	A
Rosemont Avenue and Old Farm Drive/Doughten Drive (Old Farm Gate)	A	A
Nearby off-post intersections		
Rosemont Avenue and Military Road/Baughmans Lane	F	F
Opossumtown Pike and Fairfield Drive/Porter Street	B	A
Rosemont Avenue and Montevue Lane	C	F
Opossumtown Pike and Amber Drive	A	A

Source: STV, 2003.

Virginia. Amtrak provides passenger service out of Baltimore and Washington, D.C. Access to all areas served by Amtrak can be attained from these stations.

4.10.2 Consequences

4.10.2.1 Proposed Action

Short- and long-term minor adverse and long-term beneficial effects on transportation would be expected. During the construction and renovation phase, traffic congestion could occur, particularly during rush hours as construction vehicles enter and exit Fort Detrick via the Old Farm Truck Gate or transport construction/demolition debris from the project site to a landfill. Wear and tear on installation roads would increase because of use by construction vehicles, and these roads may temporarily require an increase in maintenance activities to prevent road failure. Such effects would be minimized by directing all RCI construction vehicles to access the installation via the Old Farm Truck Gate at Fort Detrick, reducing construction vehicle movement during peak rush hours, and placing construction staging areas in locations that would minimize construction vehicle traffic near housing and administrative areas. In addition, road closures to accommodate utility construction and installation would be anticipated and could create additional short-term traffic delays and utility outages.

Because the Main Gate would serve as the primary access point for RCI residential traffic (Bennett, 2002), long-term minor adverse effects would be expected at the Main Gate under its current configuration since an additional 163 family vehicles would be entering and exiting the installation. The Main Gate already experiences traffic backups during peak traffic periods, and delays would be expected to increase as more vehicles use this gate. The proposed reconfiguration of the Main Gate would reduce off-post queuing spillover by providing increased on-post queuing capacity and reduce the current conflict with the intersection of Ditto Avenue and Porter Street by moving traffic entry flow farther to the east. This would reduce traffic congestion at the gate and would be expected to help alleviate the increase in on-post traffic projected over the next 5 years. Similar reconfigurations are planned at the Opossumtown and Old Farm Gates. Additional proposed road improvements to on-post roads, including Porter Street, Ditto Avenue, Chandler Drive, and Doughnten Drive, would be expected to further alleviate traffic congestion on-post (STV, 2003).

To estimate the effect of the proposed action on traffic levels at the intersection of Porter Street and Ditto Avenue, an analysis was conducted to account for the additional 163 vehicles moving through this intersection during peak traffic times. The traffic analysis in Table 4-9 assumes that although Fort Detrick soldiers moving into one of the new on-post housing units would no longer be commuting from off-post, spouses of soldiers may now be commuting off-post to work. Therefore, traffic commuting on-post during the morning rush would decrease by 163 cars, but cars commuting off-post may increase by 163 cars. Future traffic volumes for cars commuting to and from work sites off-post would be expected to increase by up to 83 percent during peak times of travel. However, the number of cars commuting off-post would still be less than those commuting on-post. The number of cars commuting on-post would decrease by about 23 percent.

The 2003 Fort Detrick transportation study estimated the 5-year increase in trip counts that would be expected from proposed major projects on Fort Detrick, including RCI. Of the total increase expected, about 7.5 percent would be attributed to RCI. This study also evaluated V/C ratios, or the degree of saturation of an intersection, for 10 intersections in the vicinity of Fort Detrick. When the V/C ratio is greater than one, the demand exceeds the capacity, and improvement may be required. To estimate the effects of RCI on off-post traffic levels, two of these intersections were analyzed further. At the Rosemont Avenue and Military Road/Baughmans Lane

Table 4-9
Projected Peak Time Vehicular Traffic
at the Intersection of Porter Street and Ditto Avenue

Direction	Peak Time	No. of Vehicles	+/- 163 RCI-Related Vehicles	Percent Change
Northbound (Entering Fort Detrick)	7:30 a.m.–8:30 a.m.	755	592	-22
	4:30 p.m.–5:30 p.m.	223	386	+73
Southbound (Leaving Fort Detrick)	7:30 a.m.–8:30 a.m.	197	360	+83
	4:30 p.m.–5:30 p.m.	869	706	-23

Adapted from USAG Fort Detrick, 2002b.

intersection, the total A.M. V/C ratio would be expected to increase 0.2 percent, and the total P.M. ratio would be expected to increase 0.4 percent as a result of RCI. At the 7th Street and U.S. 15 southbound ramps/Biggs Avenue intersection, the total A.M. V/C ratio would be expected to increase 1.9 percent, and the total P.M. ratio would be expected to increase 1.6 percent as a result of RCI. The effects of RCI on traffic levels at these off-post intersections would be expected to be minor (STV, 2003).

Long-term beneficial effects on traffic would be expected through implementation of a well-executed CDMP. Changes to existing housing developments would be designed to reduce commercial vehicle traffic in housing areas, incorporate traffic-calming measures in the vicinity of housing, and create a more pedestrian-friendly environment.

Setbacks were incorporated into the RCI footprint to allow for potential future road closures. Should the need arise, cul-de-sacs could be constructed at the intersections of Ditto Avenue with Stark Street, Bullene Drive, Branca Drive, and Crops Way, and the intersection of Doughten Drive with the Old Farm Truck Gate access road (Figure 4-1) (Bennett, 2003).

4.10.2.2 No Action Alternative

No effects on transportation resources would be expected.

4.11 UTILITIES

4.11.1 Affected Environment

Utilities available at Fort Detrick include potable water treatment, storage, and distribution; wastewater collection and treatment; storm water management; electricity; natural gas; communications; and solid waste recycling and disposal. Fort Detrick is undergoing efforts to privatize its utilities. The natural gas system was privatized in 2001 and is now owned by Washington Gas Company. The potable water, wastewater, and electrical systems are currently in the privatization process. The following is a discussion of the location, availability, capabilities, and limitations of the utility infrastructure.

4.11.1.1 Potable Water Supply

Sources. The Monocacy River serves as the potable water supply for Fort Detrick. The installation is permitted under the State of Maryland Water Appropriation and Use Permit No. FR43S001(02) to withdraw an average of 2 million gallons per day (mgd) with a maximum withdrawal of 2.5 mgd from the Monocacy River (USAG Fort Detrick, 2002a). Fort Detrick provides drinking water that meets or exceeds all federal, state (COMAR 26.04.01), and Department of the Army (DA) criteria, and the installation's water allocation permit expires in 2012 (USAG Fort Detrick, 2003b).

Fort Detrick has a minimum flowby requirement of 26 mgd as stated in their permit (Silvestri, 2003). The installation and the City of Frederick have a verbal agreement for the exchange of potable water treatment. Under this agreement, Fort Detrick and the city occasionally exchange water between their water distribution systems through a manual connection in Area A in cases of emergencies (USAG Fort Detrick, 2003b).

Treatment. The Fort Detrick water treatment plant (WTP) is approximately 1.5 miles east of Area A. The plant intake is on the Monocacy River about 75 yards downstream from the city of Frederick's water intake. Water from the river is processed through prechlorination, chemical addition with flash mixing, flocculation, sedimentation, filtration, and addition of lime for corrosion control. Water is currently disinfected to 1.5 to 1.8 parts per million (ppm) of free residual chlorine prior to distribution. The WTP has a maximum processing capacity of 4.25 mgd. On average, the Fort Detrick WTP produces finished water at the rate of 1.3 to 1.5 mgd (USAG Fort Detrick, 2003b). The WTP is operating at approximately 33 percent of its water processing capacity.²

Fort Detrick continually monitors its potable water supply for contaminants. In 2002 the tap water at Fort Detrick met all EPA and MDE drinking water health standards (USAG Fort Detrick Environmental Office, 2003).

Storage and Distribution. Treated water is discharged into two clearwells with a total capacity of 550,000 gallons, from which it is pumped into the Fort Detrick water distribution system. Three elevated steel storage tanks at Fort Detrick maintain the distribution system under a static pressure of 60 to 70 pounds per square inch (psi). The tanks are near Buildings 725, 1409, and 1057, and they have a total storage capacity of 1.3 million gallons (USAG Fort Detrick, n.d.-a).

The water distribution system on the installation consists of about 191,000 linear feet of plastic, galvanized steel, copper, iron, and PVC distribution lines. The distribution lines are arranged in a loop configuration and serve the various functional areas of Fort Detrick through a system of mains and service laterals (USAG Fort Detrick, n.d.-a).

Fire. The Fort Detrick F&ES is in the southcentral portion of Area A in Building 1504. Area A has sufficient water pressure for the fire department to effectively respond to fire emergencies. The existing fire station will be demolished and reconstructed in mid-2004. The larger fire station will meet current USACE design criteria and will be better equipped to service Fort Detrick's fire prevention and protection needs well into the future (USAG Fort Detrick, 2003b).

Anticipated Future Capacity and Condition. Limitations of the water supply system to supporting future increased demands by Fort Detrick are line pressure and pipe size and the volume of water available from the Monocacy River. Although there is ample capacity at the WTP, the size of the pipes in the distribution system and the lack of pressure are potential

²The plant has a maximum processing capacity of 4.25 mgd. On average, 1.3 to 1.5 mgd are processed. Using 1.4 mgd as the daily average, the operating capacity of the plant is 33 percent.

weaknesses of the system (USAG Fort Detrick, 2003b). The majority of the water distribution system is more than 40 years old and will likely require increased maintenance and repair to maintain integrity (USAG Fort Detrick, 2003b). A feasibility study is currently being prepared to consider an alternative passage of water from the WTP to the installation as well as construction of an additional water tower (Bennett, 2002). The ability of the WTP to continue to supply Fort Detrick with sufficient quantities of drinking water is also dependent on the rate of flow and quality of the water received from the Monocacy River.

4.11.1.2 Wastewater System

Collection. About 60 percent to 80 percent of the water consumed at Fort Detrick becomes wastewater. An estimated 90 percent of the total wastewater generated at the installation originates as sanitary sewage. The majority of the wastewater generated travels by gravity through the sanitary sewer system to the pumping station in the southwest corner of Area A (USAG Fort Detrick, 2003b). Flow is then pumped through two 12-inch mains to Fort Detrick's wastewater treatment plant (WWTP) in Area C along the Monocacy River (USAG Fort Detrick, 1998b).

Treatment. The WWTP operates at 40 to 50 percent of its design capacity of 2 mgd (USAG Fort Detrick, 2003b). On average, Fort Detrick's WWTP processes between 750,000 and 1 million gallons of sewage daily (USAG Fort Detrick, 2003b). The sewage enters primary settling basins at the WWTP before transport to two parallel, single-stage crushed rock trickling filters for secondary treatment. The effluent exits to secondary settling basins. Chlorine is added during the treatment process, but all wastewater is dechlorinated prior to discharge into the Monocacy River, downstream from the city of Frederick and Fort Detrick WTP intakes. The WWTP operates under NPDES Permit Number MD0020877, which expired on August 31, 2003; however, this permit is effective until the renewal is issued (USAG Fort Detrick, 2003b). The annual average daily flow was 0.734 mgd in 2002, with a maximum daily flow of 1.347 mgd (Silvestri, 2003).

Condition. Smoke and camera testing on the sanitary sewer system was performed in 2000. Necessary repairs to the system were completed in 2001 to improve the overall long-term efficiency of the system (Silvestri, 2003).

4.11.1.3 Storm Water System

Fort Detrick's storm water system is operated under a General Storm Water Permit issued by MDE (USAG Fort Detrick, 1998a). In most of Area A, storm water is diverted through a system of surface ditches, inlets, culverts, and storm sewer lines. Storm water from the western and central portions of Area A, including the RCI footprint, drains into Carroll Creek, a tributary of the Monocacy River. Area A has eight sediment/storm water management ponds: two in the central portion of Area A, four in the western portion, and two in the southeastern portion. The retention pond adjacent to the NCI Frederick Campus in the western portion of Area A is designed to contain the 100-year flood (Silvestri, 2003). This dry retention pond may have to be reconfigured to comply with new quantity and quality MDE regulations. Another storm water management pond was constructed as part of the MCA housing construction project, and is located to the west of the construction site (USAG Fort Detrick, 2002c). An additional basin serves the new AP electrical substation (Bodenschatz, 2003). Several new storm water management ponds will be constructed in upcoming projects (e.g., construction of the new commissary and PX and renovation of Building 1520), including RCI (USAG Fort Detrick, 2003b). Section 4.6.1.1 provides additional discussion on the storm water management ponds in the vicinity of the RCI footprint.

4.11.1.4 Energy Sources

Electricity. The Potomac Edison Power Company (a subsidiary of AP) provides electrical power via three 34.5-kilovolt (kV) power lines to the installation. The demand for electricity at the installation is high because of the energy-intense nature of the research activities conducted at Fort Detrick (USAG Fort Detrick, 2003b). The total electrical consumption for the entire post in FY 2002, including NCI, was 139,323,476 kWh. Not including NCI, electricity consumption was 77,663,525 kWh for the year. Estimated annual electricity consumption by family housing units on Fort Detrick is 2,143,998 kWh, or about 1.5 percent of the installation's total consumption (see Appendix F). Of the 191 existing housing units, 109 are metered and read on a monthly basis (USAG Fort Detrick, 1995; Cole, 2003).

A recent improvement to the electrical system includes AP's construction of a new substation on an easement of land east of the USDA complex to meet the current and future electrical load growth requirements for northwest Frederick and the surrounding area, including Fort Detrick. The substation, construction of which is essentially complete, will initially serve AP's Clover Hill, Whittier, and Rock Creek 12.5-kV circuit service areas and reduce the loading on the installation's local 34.5-kV electrical system (USAG Fort Detrick, 2002d).

An existing AP 230-kV aerial electrical transmission line crosses the RCI footprint from the northwest to southeast, connecting with the substation (see Figure 4-1). Potential negative effects from electromagnetic force (EMF) from the transmission line and the substation on human health and safety may be a concern to residents in the RCI footprint. However, there is no evidence to support a causal relationship between exposure to EMF from powerlines and electrical substations and adverse effects on human health (USAG Fort Detrick, 2002d); therefore, no further analysis of the effects of EMF will be presented in this document.

Natural Gas. The Frederick Gas Company supplies natural gas to Fort Detrick. The distribution system consists of approximately 115,000 linear feet. As a result of privatization of the natural gas facilities at Fort Detrick, 11,500 linear feet of distribution lines in the housing area were replaced or upgraded to current standards in 2000. In FY 2002, natural gas consumption for the entire installation was 5,655,120 hundreds of cubic feet (ccf). Estimated natural gas consumption in family housing for the same period was 48,896 ccf (see Appendix F), or 0.9 percent of the installation total (USAG Fort Detrick, 2002c). Natural gas in family housing is used primarily for heating and cooking.

4.11.1.5 Communications

Telephone and cable service to Fort Detrick is offered by local service providers.

4.11.1.6 Solid Waste

The Fort Detrick municipal landfill in Area B is permitted to operate by the State of Maryland under Refuse Disposal Permit Number 2000-WMF-0327-0. The permitted area is a 60.9-acre fill area, and the permit expires in May 2005. Only waste generated at Fort Detrick is accepted at the landfill. The types of waste permitted include domestic, municipal, commercial, industrial, agricultural, silvicultural, and construction refuse. Hazardous waste is not permitted. At the end of 2001, the remaining landfill capacity reported to the MDE was 1,380,218 cubic yards. The entire landfill has approximately 288 years left before it will reach its permitted capacity (USAG Fort Detrick, 2003b).

In September 2001, Fort Detrick collected a total of 10,250 cubic yards of refuse, of which 174 cubic yards (or 1.7 percent) was generated by family housing quarters (USAG Fort Detrick, 2002c). In 2002 the total estimated solid waste generated for the installation was 86,880 cubic yards (USAG Fort Detrick, 2003b).

Fort Detrick also has an incinerator complex, which consists of two municipal waste incinerators and two medical waste incinerators. The municipal waste incinerator units were installed in 1975, and in 1995 the facility was expanded by 5,000 ft² to accommodate the medical waste incinerators. Fort Detrick is permitted to operate the municipal waste incinerators and the medical waste incinerator under Permit No. 10-000131 (Wolf, 2003). Residential, mixed residential and commercial, commercial, and special medical waste are all types of waste that are permitted for incineration at Fort Detrick. The incinerators can only accept municipal and medical waste from Fort Detrick. The municipal waste incinerators have the capacity to burn 2,000 pounds per hour (lbs/hr) and the medical waste incinerators are able to burn 1,000 lbs/hr. The incinerators can burn over 14,000 tons of waste per year, and are currently operating at 21 percent capacity. The municipal waste incinerated consists of approximately 40 percent animal bedding, 10 to 15 percent plastics, 30 percent office waste, and 5 to 10 percent wood waste. NCI is the main contributor of municipal waste. It contributes 65 percent of Fort Detrick's municipal waste. In 2001, a total of 2,273 tons of municipal waste was incinerated at Fort Detrick (USAG Fort Detrick, 2003b).

Fort Detrick operates a recycling center. Recycling is mandatory for those who live and work at Fort Detrick, and weekly curbside recycling service is provided in the housing areas. Paper, plastic, aluminum, steel, motor oil, glass products, batteries, textiles, tires, antifreeze, and fluorescent light bulbs are recycled. In 2002, Fort Detrick recycled 990 tons of material.

The Frederick County landfill, located 10 miles southeast of Fort Detrick, would be a potential alternative site for disposal or transfer of RCI-generated solid waste. The landfill is expected to reach capacity around 2017. Construction of a transfer station, which would allow disposal of waste generated in Frederick County to be disposed of at larger disposal facilities in other jurisdictions, is being considered. Construction of the transfer station would extend the life of the landfill until 2045 (Frederick County Division of Utilities and Solid Waste, 2002).

4.11.2 Consequences

4.11.2.1 Proposed Action

Calculations have been computed for each of the various utilities to determine whether or not adverse effects would be expected. The utilities calculations are provided in Appendix F. Effects on the individual utility systems are discussed below.

In addition to the effects listed below, setbacks were incorporated into the RCI footprint so that the installation could maintain control of nonhousing utilities. For example, near the USAG Commander's current residence, a 45-foot setback was needed to clear underground steam lines (Bennett, 2003).

Potable Water Supply. Long-term minor adverse and beneficial effects would be expected. Fort Detrick's population would increase as a result of the proposed action, as would consumption of potable water. The percent of the installation's potable water consumed by family households would be expected to increase from 4.8 percent to 7.8 percent (see Appendix F). The WTP is, on average, operating at 33 percent of its capacity and would therefore be able to meet the increased demand for potable water. However, long-term minor adverse effects would be expected because of the increased demand on an aging system. The majority of the Fort Detrick water distribution system is more than 40 years old and will likely require increased maintenance and repair to maintain integrity. The size of the pipes in the distribution system and lack of pressure are also potential weaknesses in the system (USAG Fort Detrick, 2003b).

Long-term beneficial effects would be expected from the construction of new distribution lines and from new appliances. Areas of new construction would receive new water distribution lines, providing improved water delivery and reduced water exfiltration and loss. New housing would

have water-efficient control devices such as low flow showerheads, faucets, and toilets installed to reduce per capita water consumption.

Fire. No adverse effects would be expected. The water distribution system in Area A would continue to have sufficient water pressure for F&ES to effectively fight fires should they occur following construction and occupation of new housing units in the RCI footprint (Eskildsen, 2003).

Sanitary Wastewater. Long-term minor adverse and beneficial effects would be expected. RCI would increase the on-post population, generating additional wastewater and demand on the sanitary sewer system, resulting in long-term adverse effects on the WWTP.

Long-term beneficial effects would also be expected in areas of new construction that would receive new wastewater collection lines. The new lines, coupled with recent wastewater pipeline repairs, would reduce infiltration into the wastewater collection system and improve the overall long-term efficiency of the system.

The projected increase of 163 housing units is not anticipated to strain the capacity of the existing wastewater system. The percent of the installation's wastewater generated by family households would be expected to increase from 6.8 percent to 9.4 percent (see Appendix F). The current operating capacity of the WWTP is 40 to 50 percent, indicating room for the additional demand (USAG Fort Detrick, 2002a).

Storm Water. Long-term minor adverse effects would be expected. Storm water runoff is a function of the amount of impervious surfaces on the installation. The addition of 163 housing units would increase the amount of impermeable surface on Fort Detrick. However, storm water management ponds constructed for storm water quality recharge to maintain preconstruction infiltration rates and storm water quantity detention designed to handle the 1-, 2-, 10-, and 100-year storm events to protect channel erosion and overbank flood protection would reduce adverse effects from increased storm water runoff discharging into Carroll Creek (Lewis, 2003; USAG Fort Detrick, 2003b). GMH is planning to construct two storm water management facilities to complement the existing basin just west of the recently completed MCA housing area. The two new basins would be located on-post between proposed Villages 1 and 3, and would have a combined surface area of 105,000 ft². In accordance with COMAR 26.17.02, GMH would be required to obtain approval from MDE for the storm water management and erosion and sediment control measures implemented during construction. Further discussion on storm water management is provided in Sections 4.5 and 4.6.

Energy. Long-term beneficial effects would be expected on the installation's electrical and natural gas systems. Under the proposed action, the electricity consumed by family households as a percentage of the installation as a whole would be expected to increase from 1.5 percent to 2.5 percent (Appendix F). With the construction of the new AP substation, it is expected that the electrical system would meet the future electrical load growth requirements for Fort Detrick. In addition, the new housing units would have energy-efficient interior and exterior lighting fixtures and interior appliances.

Under the proposed action, the percent of the installation's natural gas consumed by family households would be expected to increase from 0.9 percent to 1.3 percent (Appendix F). The natural gas facilities in the existing housing area were replaced and upgraded to current standards in 2000. New gas distribution lines would be constructed in the proposed RCI housing areas. The increase in natural gas demand from the additional 163 RCI housing units would not be expected to constrain the system.

Communications. Long-term beneficial effects would be expected. New and renovated homes would be wired for cable and Internet access. Local service providers would continue to offer phone and cable service to residents.

Solid Waste. Long-term minor adverse effects would be expected. Debris from construction, demolition, and renovation of family housing units would increase substantially during the construction period relative to the solid waste typically generated annually by the installation. In addition, the percentage of the installation's solid waste generated by family households during the operation phase of RCI would be expected to increase from 3.0 percent to 5.0 percent (Appendix F). These factors would increase the fill rate a landfill. GMH has submitted a request to Fort Detrick to allow disposal of RCI-generated construction and demolition debris in the Fort Detrick landfill. However, has about 288 years remain before the landfill is estimated to reach its permitted capacity (USAG Fort Detrick, 2003b), and therefore it should be able to accommodate RCI-generated debris. A potential alternative for disposal or transfer of solid waste is the Frederick County landfill, which has a 40-year capacity pending construction of a transfer station. Waste generated from construction of new RCI housing may be accepted at this landfill, however, demolition debris potentially containing hazardous materials may not be accepted (Norwood, 2003). A third alternative is for GMH to employ the services of a waste management contractor, who disposes of the waste at an approved disposal site, which may be outside of Frederick County. Table 4-10 provides estimates of construction and demolition debris generated as a result of implementing the RCI program at Fort Detrick. Certain solid wastes, such as brick, concrete, and asphalt, would be recycled to the maximum extent feasible.

4.11.2.2 No Action Alternative

No effects would be expected. Repair and maintenance of utility systems would continue to occur on an as-needed basis.

4.12 HAZARDOUS WASTE

4.12.1 Affected Environment

Specific environmental statutes and regulations govern hazardous material and hazardous waste management activities at Fort Detrick. For the purpose of this analysis, the terms *hazardous waste*, *hazardous materials*, and *toxic substances* include those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), or the Toxic Substances Control Act (TSCA). In general, they include substances that, because of their quantity, concentration, or

Table 4-10
Estimates of Construction and Demolition Debris Generated as a
Result of Implementing the RCI Program at Fort Detrick

Construction Type	Housing Unit Type	Average Gross Ft ²	Number of Units	Gross Ft ²	C&D ¹ Factor Lbs/Ft ²	Waste In Tons
New Construction	Varies	1,500	292	438,000	4.38	959
Technical Renovation	Varies	1,500	62	93,000	19.8	921
Demolition of Existing Units	Varies	1,200	127	152,400	115	8,763
TOTAL				683,400		10,643

¹ Construction and Demolition.

physical, chemical, or toxic characteristics, may present substantial danger to public health or welfare or the environment when released into the environment.

To identify areas where possible storage, release, or disposal of hazardous substances or petroleum products or their derivatives has occurred, the Army, through contractor support, prepared an Environmental Baseline Survey (EBS) of those areas at Fort Detrick considered for RCI project development (Tetra Tech, 2003). The EBS also identified any existing non-CERCLA-related environmental or safety issues (e.g., ACM and LBP) that would limit or preclude use of the property for RCI actions. A summary of the findings contained in the EBS has been included in the following sections.

4.12.1.1 Uses of Hazardous Materials

Previous investigations have identified hazardous substances present in housing units on Fort Detrick (Cole, 2001). Although these materials are now known to be hazardous, they were widely used in the building products industry and for housing maintenance for many years. Their presence in the housing units does not constitute a health hazard under normal circumstances, and the materials are being removed or encapsulated as the units are renovated. These hazardous materials include ACM, LBP, pesticides, and possibly polychlorinated biphenyls (PCBs). ACM includes, but is not limited to, tile floor covering and plumbing insulation. LBP was identified on interior and exterior surfaces, including windows, doors, walls, baseboards, and shelves. The EBS also identified use of the pesticide Chlordane on the installation prior to 1988 (Tetra Tech, 2003). The presence of ACM, LBP, PCBs, and pesticides in the family housing areas is discussed in greater detail in Section 4.12.1.5, Special Hazards.

Numerous maintenance activities require the use and storage of regulated and nonregulated hazardous materials. Examples of these activities include vehicle operation and maintenance, hospital services, and grounds maintenance. The family housing operations and maintenance contractor uses a wide variety of chemicals, typically in small quantities, including hazardous materials, in and around family housing and support facilities. Examples of these chemicals are paint, pesticides, herbicides, and cleaning solvents. Housing vehicles and small engine units (lawnmowers, blowers, etc.) are also used and maintained by housing operations staff. Specially trained staff apply pesticides to common facilities and to individual housing units as requested. Residents are allowed to use commercial off-the-shelf products as necessary. No estimates are available on the locations, volumes, extent, strength, persistence, or toxicity of materials applied by residents.

4.12.1.2 Storage and Handling Areas

There are currently 11 underground storage tanks (USTs) and 33 aboveground storage tanks (ASTs) on Fort Detrick (Gortva, 2003). The USTs, which were installed between 1986 and 1996, are used to store heating fuel oil, diesel fuel, and gasoline, and they range in size from 8,000 to 30,000 gallons. Forty-six former USTs at Fort Detrick have been removed, cleanups have been performed as necessary, and they have received no further action status from the MDE (USAG Fort Detrick, 1998b). All remaining USTs were installed with modern corrosion protection, spill and overflow prevention equipment, and are in compliance with MDE Title 26, Subtitle 10, *Oil Pollution and Tank Management*. The ASTs are used to store diesel fuel, fuel oil, and used oil, and they range in size from 250 to 648,000 gallons. All active ASTs are currently in compliance with MDE regulations. No active USTs or ASTs are found within the RCI footprint. The nearest USTs are at a gasoline station about 750 feet from the housing area (Tetra Tech, 2003).

Several hazardous material and specialty chemical storage areas for government-owned and operated facilities are used for small-quantity chemicals in the RCI footprint. It is anticipated that hazardous materials, such as paints, solvents, cleaners, asphalt, and fuels and motor oils for

construction vehicles, will be stored and used by GMH during new construction, renovation, demolition, and operations and maintenance activities. Hazardous materials used by GMH during the RCI process would be managed and stored in accordance with applicable federal and state regulations. Materials that could pose an environmental concern include paints, solvents, detergents, and pesticides (see Section 4.12.1.5, Special Hazards).

4.12.1.3 Hazardous Waste Disposal

A number of hazardous wastes, as defined by RCRA, are generated from the normal operations of Army programs at Fort Detrick. Storage and disposal of hazardous wastes on Fort Detrick are detailed in the Hazardous Waste Management Plan (HWMP). The Garrison Commander has established a Hazardous Waste Management Board, an informal board designed to resolve issues and coordinate the management, storage, and disposal of hazardous waste (Tetra Tech, 2003).

To facilitate the disposal of hazardous waste/material, all hazardous waste that is generated by government-owned and -operated facilities on the installation is collected by the generating tenant in satellite accumulation points (SAPs). A SAP is a hazardous waste collection area where a generator may accumulate up to 55 gallons of hazardous waste or 1 quart of acutely hazardous waste. The Defense Reutilization and Marketing Service (DRMS) is responsible for ensuring proper disposal of hazardous waste at RCRA-permitted treatment, storage, or disposal sites. Hazardous waste production in Fort Detrick Area A was 23,083 pounds in FY 2002 (USAG Fort Detrick, 2003b).

It is anticipated that GMH would generate hazardous wastes during new construction, renovation, demolition, and operations and maintenance activities. Hazardous wastes generated during the RCI process would be disposed of in accordance with applicable federal and state regulations.

4.12.1.4 Site Contamination and Cleanup

Area A was included in a Phase I and Phase II Remedial Investigation (RI) conducted at Fort Detrick. The investigation included seven sites on Area A including three water towers, Building 568, the Cleanfill Area, the proposed commissary site, and a former combustible burn pit area. None of these sites are in the RCI footprint, but the west water tower is near the southwest corner of the RCI footprint, and the north water tower is adjacent to the east side of the footprint. Soil under these water towers is contaminated with lead; however, according to the Human Health Risk Assessment performed for the water tower sites and included in the RI report, the lead concentrations posed no significant risk to human health. Therefore, no remedial action is required for these sites. Building 568, in the extreme southwestern portion of Area A, has groundwater beneath it that is contaminated from a trichloroethylene (TCE) spill. The Cleanfill Area site, which received and landfilled construction material, is in the southeast portion of Area A. The proposed commissary site, which has soil contaminated with metals, is in the southeast corner of Area A. The former combustible burn pit area, which was used to burn scrap lumber and possibly a petroleum product, is also in the southeastern corner of Area A. No further action is planned for six of these sites; the one site that does require additional investigation and/or remediation is the TCE spill near Building 568.

A former recreational skeet range in the southeast corner of Area A has been identified as a potential area for lead contamination from firearm discharge. The range was in operation from the 1950s through the 1980s near Buildings 1520 and 1434. A soil RI was conducted on the site in July 2003. Laboratory results showed lead levels to be slightly higher than background levels for that area, but below MDE residential and industrial risk-based concentration levels of 400 mg/kg and 1,000 mg/kg. Therefore, no remediation of the area was deemed necessary (Tetra Tech, 2003).

4.12.1.5 Special Hazards

Asbestos. EPA and the Occupational Safety and Health Administration (OSHA) regulate remediation for ACM. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the CAA, which established the National Emissions Standards for Hazardous Air Pollutants. These standards address demolition or renovation of buildings with ACM.

Records relating to asbestos identification, control, and removal actions are made available upon request from the Fort Detrick Housing Office. Supervisors, maintenance workers, facility managers, project engineers, and contractors are required to review existing asbestos records before starting any maintenance, repair, renovation, or demolition activities. All ACM subject to disturbance in such projects must be abated by trained and qualified asbestos personnel before a work order is turned over to maintenance personnel or a general contractor. The Asbestos Management Plan for Fort Detrick details the requirements for asbestos abatement, including the notification requirements, organizational roles and responsibilities, training, and record-keeping (Tetra Tech, 2003).

Fort Detrick has engaged in intensive programs to remove ACM from all family housing units since it was identified as a health risk to humans. All ACM was removed from the plumbing and heating, ventilation, and air conditioning (HVAC) systems of the Capehart-era housing units and Buildings 1400 and 1654 by 1989. Another project completed in 1998 removed all known asbestos-wrapped plumbing pipes and HVAC systems and exposed asbestos floor tile from all housing units. All known ACM plumbing insulation in Building 1652 was removed in the last 3 years. It is possible that small amounts of ACM may still be found in hidden or heavily embedded areas of Fort Detrick housing units (Cole, 2001).

PCBs. PCBs are industrial compounds used in electrical equipment, primarily capacitors, and transformers because they are electrically nonconductive and remain stable at high temperatures. Because of their chemical stability, PCBs persist in the environment, bioaccumulate in organisms, and become concentrated in the food chain. The disposal of PCBs is regulated by TSCA, which regulates the removal and disposal of contaminated equipment containing PCBs at concentrations greater than 50 ppm. Approximately 20 pole-mounted transformers are located in the housing areas. These transformers have not been tested for PCBs. They are treated as PCB transformers until they develop a problem, at which time they are tested and removed (Allnutt, 2002). All ground-based transformers classified as “PCB” or “PCB-contaminated” are believed to have been removed (USAG Fort Detrick, 1998b).

LBP. Current Army policy calls for controlling lead-based paint (LBP) by using in-place management. In-place management is used to prevent deterioration over time of those surfaces likely to contain LBP, followed by replacement as necessary. Maintenance staff and residents are given instructions on routine cleaning procedures leading to capture of LBP fragments from suspected locations. LBP materials on existing housing would be encapsulated and/or removed in accordance with Army and OSHA guidelines. LBP debris from renovation and demolition activities would be managed and disposed of as construction debris in accordance with applicable regulations. In addition, GMH would ensure that housing occupants receive an LBP pamphlet notifying them of potential risks as individual quarters are leased.

Fort Detrick has engaged in extensive programs to remove LBP from all family housing units since it was identified as a health risk to humans. A project completed in 1998 removed and replaced all interior wood that had been painted with LBP from all housing units. Another project that began in 2000 will complete abatement of the Capehart-era housing units. All exterior wood in the housing units has been encapsulated with siding or cladding. It is possible that small amounts of LBP may be found in hidden or heavily embedded areas of Fort Detrick housing units (Cole, 2001).

An LBP survey was conducted on Fort Detrick between 1990 and 1995, but soil samples were not collected from around the housing units or playgrounds. According to TSCA Section 403, a soil-lead hazard is present on residential property or at a child-occupied facility when concentrations in the soil exceed 400 ppm or 1,200 ppm of bare soil in the rest of the yard (non-play areas). As required by CERCLA 120(h), the DoD will retain liability for environmental restoration of the property.

Pesticides. Pesticides have been used in housing areas and industrial areas across the installation. Pesticides that are currently used at Fort Detrick include Diazinon and copper sulfate. Chlordane was applied to these areas until 1988, when EPA banned it from further use, pending additional carcinogenic risk assessments. However, Chlordane is generally not considered to be a hazardous waste if it was applied for its intended use as a pesticide, as opposed to storage, disposal as waste material, or migration to its current location from the application site. Although pesticide is not considered a hazardous waste as defined by the Solid Waste Disposal Act (SWDA), materials leaching Chlordane at concentrations greater than 0.03 milligrams per liter (mg/L) upon excavation are defined as hazardous by the Toxic Characteristic under RCRA and must be dealt with accordingly.

Radon. Radon is a gaseous radioactive element that occurs by the decay of radium associated with the breakdown of minerals in the earth. Radon can be found in high concentrations in soils and rocks containing uranium, granite, shale, and phosphate. Atmospheric radon is diluted to insignificant levels; however, when concentrated in enclosed areas, radon can present human health risks. Fort Detrick conducted radon testing in the housing areas beginning in 1989. Test results for radon in most of the Fort Detrick family housing units were below the EPA action guidelines of 4 picoCuries per liter (pCi/L). Housing units with test results that exceeded 4 pCi/L were subsequently retested for 1 year. Test results exceeded the action guidelines in only three units, which were subsequently mitigated (USAG Fort Detrick, 1998b; Gortva, 2002; Sheffer, 2003).

Radioactive Materials. Fort Detrick holds a license, valid until 2007, with the Nuclear Regulatory Commission (NRC) for the collection, storage, and disposal of low-level radioactive wastes. Fort Detrick no longer generates radiological wastes and is currently undergoing decommissioning activities. The installation has notified the NRC of its intention to discontinue license operation and has requested license termination, and a decommissioning plan was submitted in October 2002. Fort Detrick is required to complete decommissioning activities by October 2004. Available evidence suggests that no radioactive materials have ever been used or stored in the RCI footprint (Tetra Tech, 2003).

Medicinal/Biohazardous Waste and Silver Recovery. The primary generators of medical waste at Fort Detrick are the FCRDC, USAMRIID, and USDA. In addition, the Army Dental Clinic generates small quantities of medical waste. In FY 2002, about 1,023 tons of medical waste were generated. All medical wastes are collected by the Directorate of Installation Services and delivered to an incinerator complex on-post. The wastes are inspected prior to incineration to ensure that they are properly packaged, sealed, labeled, and identified. All medical wastes, including pathological waste, are burned in two incinerators that each have a capacity of 1,000 pounds per hour (lbs/hr). Two additional 150-lbs/hr-capacity pathological waste incinerators are currently not used. The average incineration rate is about 2 tons per day. The ash from the incinerators is disposed of at the Fort Detrick municipal landfill in Area B.

Spent photo-development waste is first processed for silver recovery on-site and then also properly disposed of by the incinerators. Available evidence suggests that there are no concerns from photo-developing, silver recovery, or medical waste recycling in the RCI footprint (Tetra Tech, 2003).

Mold. Mold spores continuously migrate through indoor and outdoor air, and can grow and reproduce in wet mediums on wood, paper, carpet, and foods. When excessive moisture or water accumulates indoors, mold growth often occurs, particularly if the moisture problem remains undiscovered or unaddressed. Moisture problems in buildings can be caused by a variety of conditions, including roof and plumbing leaks, condensation, and excess humidity. Some of the potential effects and symptoms associated with mold exposures are allergic reactions, asthma, and other respiratory complaints.

Several residential units on Fort Detrick have been found to contain areas where minor mold growth was present. Bathrooms were the most common locations where mold growth was found. A few of the housing units showed evidence of mold on the exteriors (Tetra Tech, 2003).

4.12.2 Consequences

4.12.2.1 Proposed Action

No effects would be expected. All known hazardous materials have been or are scheduled to be abated from the housing units on an ongoing basis. No environmental or health effects resulting from the removal, handling, and disposal of hazardous materials would be expected during demolition or renovation activities. A Hazardous Waste Management Plan will be developed by GMH and provided to the Fort Detrick Environmental Office for approval prior to RCI construction and will be followed throughout construction. Demolition waste that contains ACM and LBP would be handled in accordance with all applicable regulatory requirements. Wastes that contain ACM generated during demolition activities will be handled, remediated and removed by a licensed contractor, and all hazardous materials will be properly disposed of in an authorized disposal site. LBP debris is exempt from hazardous waste regulation and therefore can be managed as construction debris with no requirements for hazardous waste characterization. All renovation wastes determined to be hazardous will be managed in accordance with applicable federal and state regulations.

Prior to construction, demolition, or renovation activities, a soil analysis would be conducted for the presence of lead levels that exceed 400 ppm. This would help determine whether soil abatement or application of additional layers of clean topsoil is necessary. Pesticides, including Chlordane, are present in the lawns of some of the housing units. However, Chlordane is generally not considered to be hazardous waste if it was applied for its intended use as a pesticide. Material leaching pesticides in concentrations exceeding 0.03 mg/L upon excavation is considered hazardous under RCRA and would be remediated through abatement or application of additional layers of clean topsoil.

Additional potentially hazardous materials that could be found on-site during RCI project-related activities include paints, solvents, cleaners, asphalt, and fuels and motor oils for construction vehicles and equipment. The construction contractors would be responsible for collecting and storing potentially hazardous materials used or found on-site in proper containers for a limited amount of time, properly disposing of them in accordance with applicable federal and state laws, and preventing spills of paint and fuels. Spills could be prevented by proper storage and handling, attention to the task at hand, and responsible driving. Some materials, while essentially inert under normal conditions, can be potentially hazardous under specific circumstances. Wood and dry concrete can generate airborne particulates as they are cut or sanded. To protect against adverse effects, workers should wear facemasks and safety glasses when performing these tasks. Wood and other construction materials are also flammable. Establishing smoking areas and prohibiting open flames near flammable materials would greatly reduce the risk of fire.

A refuse contractor will periodically collect and properly dispose of residential hazardous waste. Housing residents will be briefed and given a resident guide on proper hazardous waste disposal

procedures during in-processing. If any hazardous waste is found in the housing areas, operations and maintenance personnel will secure it and ensure that a licensed hazardous waste contractor disposes of it properly.

4.12.2.2 No Action Alternative

No effects would be expected. All known hazardous materials have been or are scheduled to be abated from the housing units at Fort Detrick, therefore, no environmental or health effects resulting from the removal, handling, and disposal of hazardous materials would be expected.

4.13 CUMULATIVE EFFECTS SUMMARY

The cumulative effects of the proposed action and concurrent activities would be expected to be minor. No current or future off-post actions that would create cumulative effects on Fort Detrick have been identified.

In addition to the RCI program, numerous construction activities are planned on the installation over the next several years. During this period there could be short-term, intermittent minor adverse cumulative effects on air quality, noise, and traffic in the vicinity if these other construction projects were to occur concurrently with the RCI housing construction project. Such activity would lead to a temporary increase in construction vehicles in the vicinity. Future projects identified at this time that would occur in the immediate vicinity of the RCI footprint include the remote truck inspection station and the Biomedical Research Campus. The truck station could potentially pose long-term localized effects on air quality, noise, aesthetics, and safety. However, the effects on the existing housing area would be minor given the distance from the nearest existing or proposed housing unit to the proposed truck station (450 feet). Proper coordination of site planning for the new housing units with design of other proposed construction projects in the vicinity of the RCI footprint would mitigate the potential adverse effects on both on- and off-post residents.

Long-term minor adverse cumulative effects could occur as additional construction projects replace permeable ground surfaces with impervious surfaces, such as parking lots, roads, roofs, and sidewalks. As imperviousness increases, the potential also increases for nonpoint source pollution, such as oil and grease, metals, nutrients, and bacteria, to discharge into waterways. In addition, increases in impervious areas can increase the volume and velocity of storm water entering a waterway, which can erode stream banks and result in the discharge of sediment and riparian instability. GMH would address these issues by designing, constructing, and maintaining (for 50 years) appropriate storm water management facilities for the new housing areas to help counter the additional runoff generated from the cumulative impacts of development.

The new housing areas on-post would be a land use that is compatible with existing off-post neighborhoods. An existing buffer of trees along the installation boundary would be expanded as planned in the CDMP. In addition, no construction of on-post housing units or access roads is planned within about 100 feet of the installation boundary to adhere to a DoD policy of restricting future on-post development near installation boundaries for security reasons. This 100-foot buffer, which consists of 50 feet of open space along the installation boundary and then a 50-foot wide vegetated buffer, would also ensure safety, aesthetic quality, and reduced noise levels for off-post residents. No other current or future off-post actions that would create cumulative effects on Fort Detrick have been identified.

Construction of family housing on Fort Detrick would have beneficial effects on the economy by providing construction industry sales and employment and by increasing the availability of off-post housing, when about 163 soldiers and their families move from off-post within the ROI onto Fort Detrick.

Long-term minor adverse cumulative effects on transportation could be expected at the Main Gate because the vehicles of an additional 163 families would be entering and exiting the installation. The Main Gate already experiences traffic backups during peak traffic periods, and delays would be expected to increase as more vehicles use this gate. The proposed reconfiguration of the Main Gate and nearby road improvements, which would provide for additional capacity and would reduce the current conflict with the intersection of Ditto Avenue and Porter Street by moving the traffic entry flow farther to the east, would improve current Main Gate traffic congestion and would be expected to help alleviate the increase in on-post traffic. The proposed development projects at Fort Detrick, including RCI, would compound existing road infrastructure deficiencies in the vicinity of the installation. However, programmed road improvements would help to alleviate the deficiencies, resulting in a minor adverse effect on off-post traffic levels.

RCI construction activities are expected to generate an estimated 10,000 tons of solid waste. Disposal of unrecyclable solid waste generated by RCI may contribute to cumulative adverse effects to the regional solid waste stream, particularly if the waste were to be disposed of at the Frederick County landfill, which has a limited capacity.

4.14 MITIGATION SUMMARY

Mitigation measures for the proposed Army RCI project will be incorporated into the CDM. Such measures would be expected to reduce, avoid, or compensate for most adverse effects. Table 4-11 summarizes the proposed mitigation measures to be taken for each of the affected resources.

Table 4-11
Summary of Mitigation Measures

Land Use	
⌘	Adhere to optimal land use plans and guidelines outlined in the <i>Installation Master Plan Environmental Assessment for Fort Detrick</i> when siting housing developments.
⌘	Coordinate site planning for the new housing units with the design of other proposed construction projects in the vicinity of the RCI footprint to minimize potential adverse effects on both on- and off-post residents.
Aesthetics and Visual Resources	
⌘	Design housing units in a regionally appropriate architectural style.
⌘	Revegetate housing areas with native vegetation.
⌘	Maintain trees and native vegetation wherever possible.
⌘	Place new utility lines underground to improve aesthetics.
Air Quality	
⌘	Use construction equipment diesel fuel with a sulfur content of 0.05 percent or less.
⌘	Phase new housing construction over an 18- to 20-month period to minimize air quality impacts.
⌘	Spray water on work sites to reduce fugitive dust emissions.
Noise	
⌘	Limit construction activities to daylight hours.
⌘	Use earthen berms and tree buffers to separate noise-producing land uses from housing areas where appropriate.

Table 4-11
Summary of Mitigation Measures

Geology and Soils	
≠	Avoid construction near existing sinkholes. Perform site evaluations for potential sinkholes. Implement remedial actions, such as filling and/or plugging, if necessary.
≠	Use appropriate BMPs (such as silt fences, strawbale dikes, diversion ditches, reseeding, riprap channels, water bars, water spreaders, and storm water management ponds) to reduce soil erosion and sedimentation.
Water Resources	
≠	Conduct a storm water analysis to determine the amount of new impervious area that would be created by implementing the proposed action.
≠	Implement BMPs to control surface erosion and runoff (e.g., silt fencing, hay bales).
≠	Follow protocols outlined in the Fort Detrick NPDES storm water permit and state sediment and erosion control guidelines.
≠	Implement storm water management retention and detention measures for 1-, 2-, 10-, and 100-year storm events in accordance with approved plans and specifications.
≠	Reseed and revegetate areas following construction activities to minimize impacts.
Biological Resources	
Vegetation	
≠	Develop a Forest Management Plan to determine acres of afforestation required per MDNR regulations. The trees planted must be maintained for 2 years so that the minimum 65 percent survivability rate can be ensured.
≠	Limit disturbed areas to the current housing footprint and a minimal amount of adjacent construction staging areas.
≠	Plant native trees and drought-tolerant vegetation near homes, in parks, and in open spaces and around the storm water management structures.
≠	Employ erosion control practices and tree protection devices at all proposed sites to protect vegetation and habitat areas.
Wildlife	
≠	Preserve associated roads, existing parks, and large blocks of existing native vegetation on each site to act as buffers and wildlife corridors if possible.
Cultural Resources	
≠	Include clauses in construction contracts stating that in the event archaeological artifacts are unearthed during construction, suspend work until a mitigation determination is made.
≠	Include the <i>Historic Preservation Covenant for Fort Detrick's Housing Units</i> in the lease agreement between Fort Detrick and GMH to ensure preservation of the historic structures (Appendix B).
≠	For structures with historic value (Building 1401), continue use as housing. Renovations to Capehart-era housing units should comply with the Army Program Comment for Capehart-era housing.
≠	For known archaeological sites, avoid the sites and protect using a buffer area.
Socioeconomics and Protection of Children	
≠	Secure construction vehicles and equipment when not in use.
≠	Place barriers and "No Trespassing" signs around construction sites where practicable.
≠	Avoid the use of building products containing hazardous materials.
Traffic and Transportation	
≠	Route all RCI construction vehicle access through the Old Farm Gate at Fort Detrick.
≠	Include design improvements, such as walkways, to reduce reliance on vehicles and to create more pedestrian-friendly communities.

Table 4-11
Summary of Mitigation Measures

<i>Utilities</i>	
Potable Water	
#	No mitigation is necessary; however, install water-efficient control devices, such as low-flow showerheads, faucets, and toilets, in all new facilities.
Energy	
#	No mitigation is necessary; however, install energy-efficient interior and exterior lighting fixtures and controls in all new units. All new units would be built to EnergyStar energy efficiency standards.

<i>Hazardous and Toxic Substances</i>	
#	Dispose of demolition materials in accordance with applicable regulations.
#	Dispose of household hazardous waste as required by Fort Detrick policies.

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